



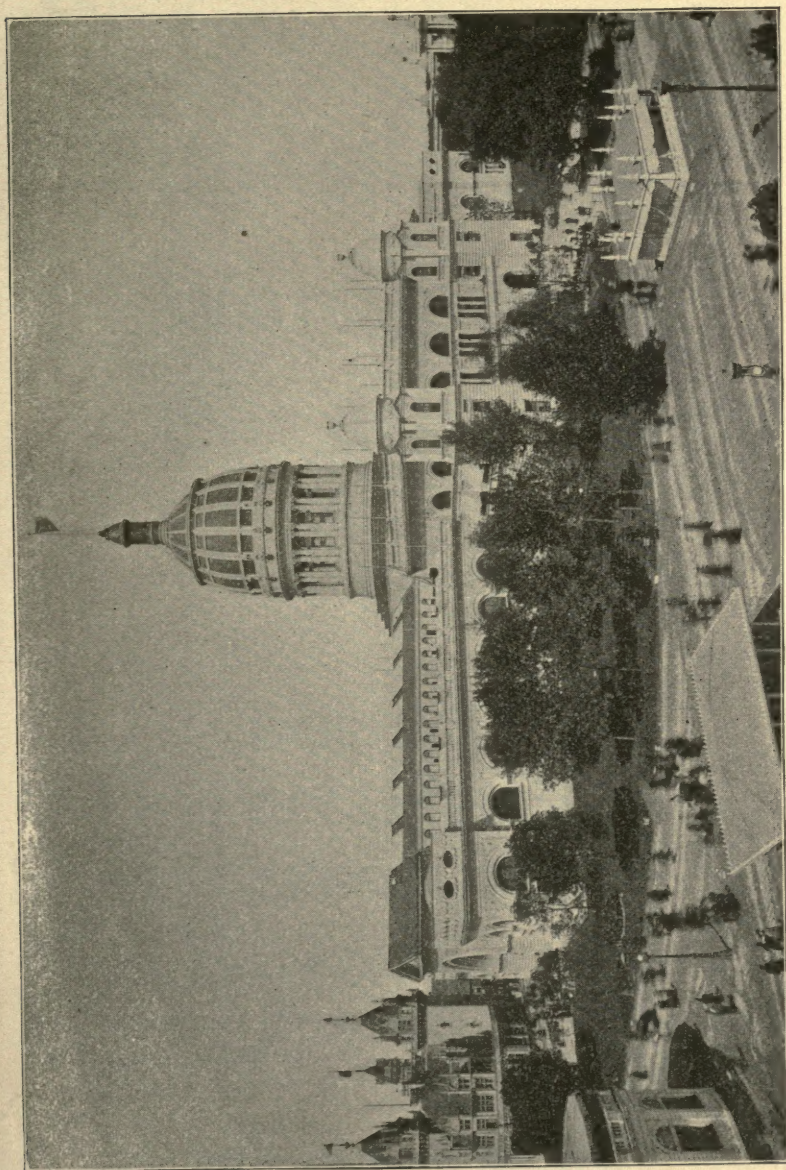






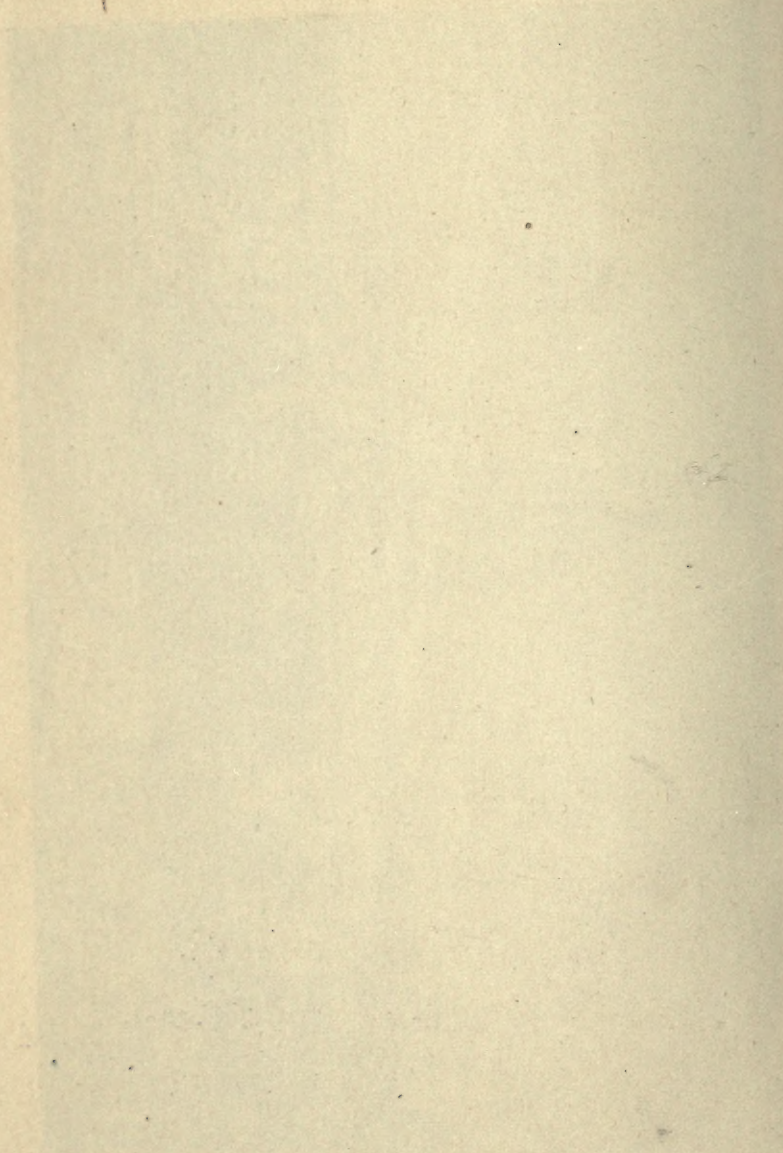
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ILLINOIS BUILDING, SOUTH FRONT.

THE UNIVERSITY OF CHICAGO



# REPORT OF THE

## Illinois Board OF World's Fair Commissioners

AT THE

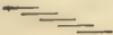
WORLD'S  
COLUMBIAN  
EXPOSITION....

*Compliments of  
James A. Rose  
Sec'y of State.*

May 1—October 30, 1893.

SPRINGFIELD, ILL.:  
H. W. ROKKER, PRINTER AND BINDER,  
1895.

Illinois Board  
of . . .  
World's Fair  
Commissioners . . . ,



OFFICERS.

*President*, LAFAYETTE FUNK, Shirley.  
*Vice-President*, DAVID GORE, Carlinville.  
*Director-in-Chief*, JOHN P. REYNOLDS, Chicago.  
*Secretary*, W. C. GARRARD, Springfield.  
*Treasurer*, JOHN W. BUNN, Springfield.

COMMISSIONERS.

J. IRVING PEARCE, Chicago.  
JOHN P. REYNOLDS, Chicago.  
J. HARLEY BRADLEY, Chicago.  
WILLIAM STEWART, Chicago.  
BYRON F. WYMAN, Sycamore.  
A. B. HOSTETTER, Mt. Carroll.  
SAMUEL DYSART, Franklin Grove.  
WARREN D. STRYKER, Plainfield.  
JOHN VIRGIN, Fairbury.  
DANIEL W. VITTUM, Canton.  
ELIJAH B. DAVID, Aledo.  
WILLIAM H. FULKERSON, Jerseyville.  
JAMES W. JUDY, Tallula.  
SHERIDAN W. JOHNS, Oreana.  
E. E. CHESTER, Champaign.  
JAMES K. DICKIRSON, Lawrenceville.  
DAVID GORE, Carlinville.  
EDWARD C. PACE, Ashley.  
B. PULLEN, Centralia.  
JAMES M. WASHBURN, Marion.  
LAFAYETTE FUNK, Shirley.  
GEO. S. HASKELL, Rockford.



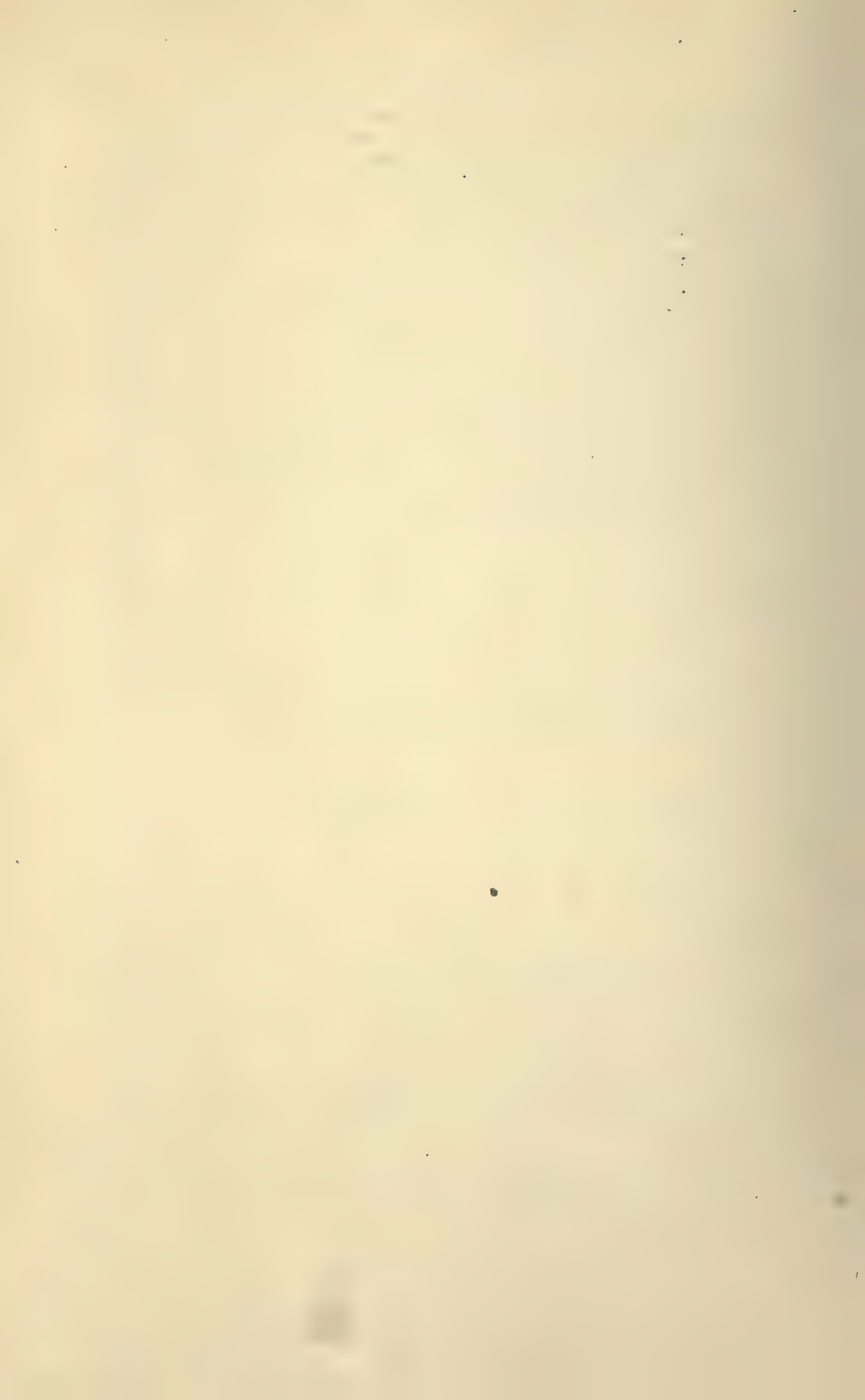
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## LETTER OF TRANSMITTAL.

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SPRINGFIELD, ILL., May 7, 1895.

*To His Excellency, JOHN P. ALTGELD, Governor of Illinois:*

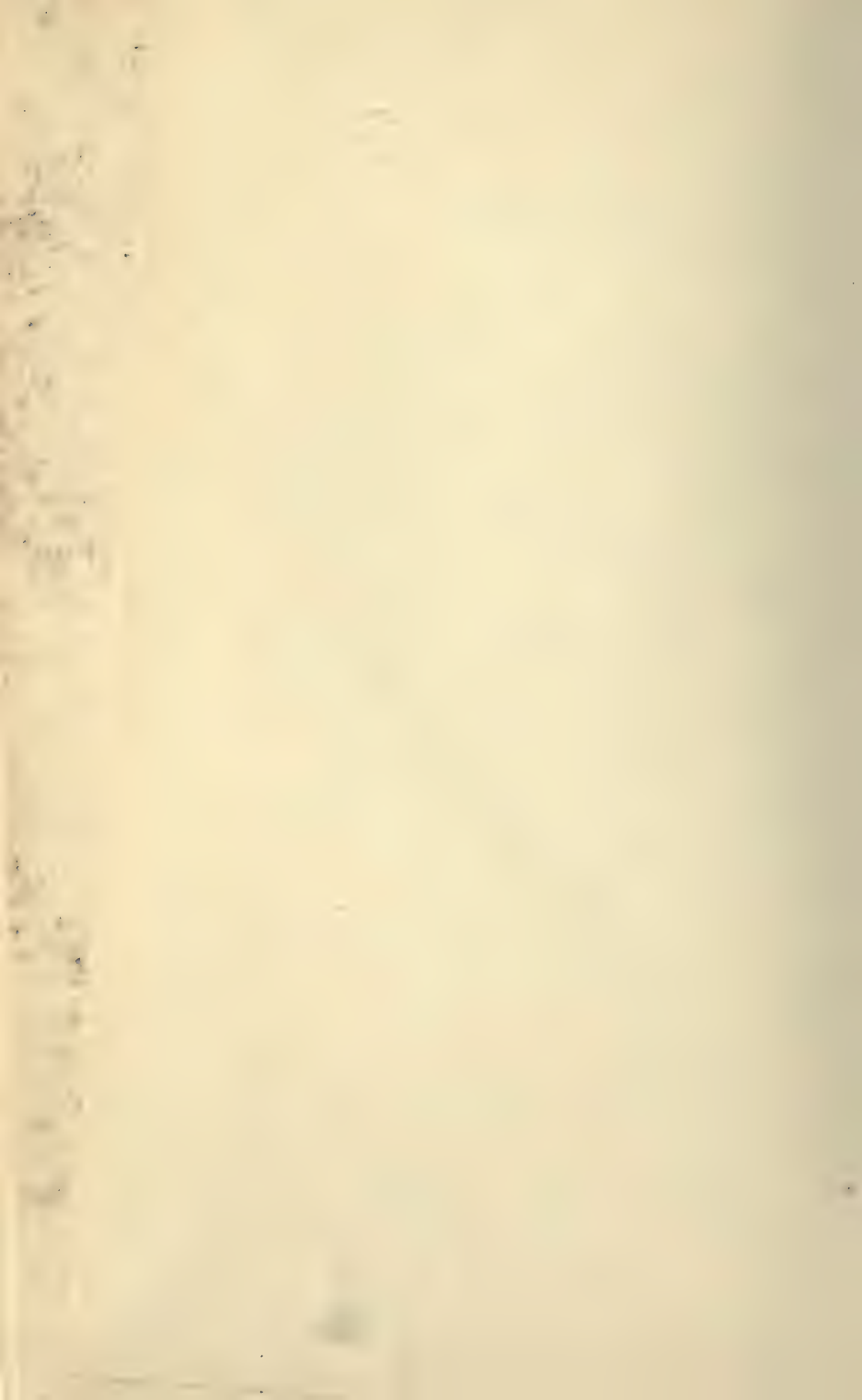
**I** HAVE the honor to herewith transmit a statement of the transactions of the Illinois Board of World's Fair Commissioners. In view of the importance of the exposition to the people, and bearing in mind the liberal appropriation made by the State, it has been deemed but a matter of justice to have each committee present a full and detailed statement of its transactions.

It is a matter of congratulation to the members of the Board, and I feel assured will be to the people, that after presenting the most elaborate exhibit of any state, as well as acting host to the people of all nations, we were enabled to return to the State Treasury for unexpended balance and salvage, over \$90,000.00.

Thanking your Excellency, as well as your immediate predecessor, Hon. Joseph W. Fifer, for the kindly manner in which our efforts have been aided,

I submit the report,

LAFAYETTE FUNK.



## REPORT OF THE PRESIDENT.

---

**B**Y virtue of "An Act to provide for the participation of the State of Illinois in the 'World's Columbian Exposition,' authorized by act of Congress of the United States, to be held in the city of Chicago, during the year 1893, in commemoration of the discovery of America in the year 1492, and for an appropriation to pay the cost and expense of the same," "the present members of the State Board of Agriculture are hereby constituted and appointed commissioners, to be known as the Illinois Board of World's Fair Commissioners. Said Board of World's Fair Commissioners shall serve until the close of the World's Columbian Exposition, and until the duties of said Commission, in connection with said Exposition, are fully performed as contemplated in this act."

This act was approved June 17, 1891.

The Board was organized in the city of Chicago, July 1, 1891, by the election of the following officers:

**PRESIDENT:**

**LaFAYETTE FUNK, Shirley;**

**VICE-PRESIDENT:**

**DAVID GORE, Carlinville;**

**DIRECTOR-IN-CHIEF:**

**JOHN P. REYNOLDS, Chicago;**

**SECRETARY:**

**WILSON COBURN GARRARD, Springfield;**

**TREASURER:**

**JOHN W. BUNN, Springfield;**

and the appointment of standing committees and the adoption of necessary rules.

### Standing Committees.

CONSTRUCTION AND INTERIOR FURNISHING—Messrs. Virgin, Pace, Pearce, Pullen, Bradley, Vittum, Judy and Washburn.

GROUNDS AND EXTERIOR ORNAMENTATION—Messrs. Pullen, Fulkerson, Dysart, Hostetter and Johns.

PRINTING AND STATIONERY—Messrs. Dickirson, Haskell, Dysart, David and Washburn.

ARCHITECTURAL DRAWINGS, TOPOGRAPHICAL SURVEY, MAPS AND DRAWINGS—Messrs. Dysart, Pace, Chester, Wyman and Stryker.

TRANSPORTATION—Messrs. Pearce, Vittum and David.

COLLECTION OF EXHIBITS — Entire Board of Commissioners.

INSTALLATION OF EXHIBITS—The President, Vice-President, and Director-in-Chief.

LIVE STOCK EXHIBIT—Messrs. Fulkerson, Chester, Virgin, Wyman and Johns.

EDUCATIONAL EXHIBIT—Messrs. Chester, Bradley, Washburn, Dickirson and Johns.

NATURAL HISTORY AND ARCHÆOLOGY—Messrs. Pace, Hostetter, Stewart, Pullen and Stryker.

CHARITABLE INSTITUTIONS—Messrs. Washburn, Hostetter, Wyman, Judy and Stryker.

FINANCE—Messrs. Stewart, Pearce, David, Bradley and Fulkerson.

RECEPTIONS AND CEREMONIES—Messrs. Judy, Haskell, Vittum, Virgin and Dickirson.

COMPENSATION—Messrs. Pearce, Pullen and Vittum.

AGRICULTURE AND DAIRYING—Messrs. Vittum, Wyman, Washburn, Chester and Fulkerson.

HORTICULTURE AND BEE CULTURE—Messrs. David, Dickirson, Stryker, Pullen and Johns.

The reports of these committees are herewith presented, and a consideration of them will show the manner in which the duties intrusted to the Commission have been discharged.

The resignation of Director-in-Chief Reynolds, at the opening of the Exposition, made it necessary that most of the duties formerly discharged by him should be undertaken by the President.

These, as well as all other duties properly belonging to the office of President of the Commission of the great State of Illinois, acting in the capacity of host of the visiting states and nations, have been discharged with an appreciation of the honors and responsibilities involved, to the best of my ability.

All of which is respectfully submitted.

LaFAYETTE FUNK,  
*President.*

## REPORT OF JOHN P. REYNOLDS,

DIRECTOR-IN-CHIEF.

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WHEN, in 1890, the Congress of the United States provided for holding the World's Columbian Exposition in the City of Chicago, in 1893, the State of Illinois was placed in very peculiar, important, and in some respects unique, relations to that event. The great honor conferred by the selection clearly brought with it obligations and duties which did not seem to rest upon the citizens of any other State in the Union.

To determine just what those obligations and the resultant duties were, and in what manner to best meet and properly discharge them, at once became a subject of serious consideration with all thoughtful citizens.

Invitations to participate in the Columbian Exposition had been extended by the President of the United States to the National Governments of the civilized world, and through him to their respective peoples individually. Similar invitations were extended to the States and citizens of the United States.

The event to be thus celebrated—the discovery of America by Christopher Columbus in 1492—was already known to all the world as having contributed to the welfare of mankind in a degree beyond all computation—as having, in much that stands for substantial progress towards the highest civilization, given a new birth to the human race. Every quarter of the globe had felt and acknowledged its benign influence, and when the great Republic of the new world made the appeal the response came at once spontaneous, enthusiastic and universal.

In this State, the Board of Agriculture having in charge the State Department of Agriculture took the initiative in canvassing the subject of Illinois' participation in the celebration. Conferences were held with Governor Fifer, the heads of the several Departments of State, of the State Educational and other institutions, with representatives of important voluntary educational, industrial and scientific associations, and with many intelligent private citizens eminent from their broad views and for their patriotic devotion to the public welfare.

In every instance such interviews were both cheering and instructive, resulting in the preparation of "a bill for an act to provide for the participation of the State of Illinois in the World's Columbian Exposition," which, being presented to the Thirty-seventh General Assembly then in session, was passed, and, by the approval of His Excellency, Governor Fifer, became a law in all its essential features June 17, 1891.

The purpose, scope and general character of the proposed exhibit by this State are succinctly stated in the following paragraphs quoted from the preamble and from sections 1, 2, 3 and 4 of the act:

"WHEREAS, The great importance to mankind of the event which it is intended thus to commemorate, the location of said Exposition in the chief city of this State, affording to our citizens opportunity for educational improvement and material benefits rarely accorded to any people, the prominent position already attained by this new commonwealth in the ranks of industrial progress and its abundant resources from which to gather additional wealth and honors—all appeal to our patriotism, State pride, sense of duty and self-interest so urgently as not to be wisely disregarded, demanding that the State of Illinois, following the example of the Federal Government, shall, in its municipal capacity,

participate as an exhibitor in the World's Columbian Exposition in a manner at once creditable to its citizens and of attractive interest to all visitors; therefore

"SECTION 1. *Be it enacted by the people of the State of Illinois, represented in the General Assembly:* That, in order that the State of Illinois may participate in the said World's Columbian Exposition, the present members of the State Board of Agriculture are hereby constituted and appointed Commissioners, to be known as the Illinois Board of World's Fair Commissioners. Said Board of World's Fair Commissioners shall serve until the close of the World's Columbian Exposition, and until the duties of said Commission, in connection with said Exposition, are fully performed, as contemplated in this act. \* \* \* \* \*

"SEC. 2. The said Board of Commissioners is hereby empowered to obtain and cause to be properly installed in said exhibition building or buildings a collective departmental exhibit for the State of Illinois, which shall illustrate the natural resources of the State, together with the methods employed and results accomplished by the State, in its municipal capacity, through its several departments, boards, commissions, bureaus, and other agencies, in the work of promoting the moral, educational and material welfare of its inhabitants, so far as such methods and results are susceptible of exhibition in the manner proposed, such collective exhibit to include and to be chiefly composed as follows:

"*First (a).* A model common school-room of high grade, fully equipped and furnished, under the direction of the State Superintendent of Public Instruction.

"*(b).* An illustration of the methods and results of educational work as pursued in the State Normal Universities, the public, technical and art schools, and the high schools of the State.

"(c). An exhibit by the University of Illinois of the equipment, methods of instruction, and achievements of that institution in its several departments.

"(d). An exhibit of the educational and industrial work as conducted in the State charitable institutions.

"(e). An exhibit illustrating the entire system of the inspection of the several varieties of grain, as established by the State Railroad and Warehouse Commission and practiced by the State Grain Inspection Department. \* \* \* \* \*

"*Second*. Collections, correctly classified and labeled, illustrating the natural history and archæology of this State, including its stratigraphical and economic geology, its soils, sub-soils, useful clays and ores, and other products of mines and quarries; its botany and zoölogy, with the products of forests, lakes and rivers; also, an exhibit by the State Fish Commission of native and cultivated live fish, with hatchery and appliances and equipments for transportation, models of fishways in use; also, a full and complete collection of all the cultivated products in the several branches of agriculture, farm culture, horticulture and floriculture, in illustration of the widely different conditions of soil and climate under which rural husbandry is practiced in the various sections of this State.

"*Third*. Architectural drawings (with elevations) of every public building erected and now used or maintained, in whole or in part, by the State, with map showing the location of each, and accompanied by historical and explanatory notes and tables; also maps, charts, diagrams and tables for the State, and, so far as practicable, for each county, showing its geology, distribution of useful minerals, its topography, with its lakes, rivers, canals and railways, its climatic conditions, its industrial growth and increase in population by decades, from the date of organization to the year 1890,

together with such other physical features as possess a scientific interest or would be taken into account in estimating the ability of our territory to maintain a dense population.

"SEC. 3. It is hereby made the duty of the officers of the several departments, boards, bureaus and commissions in the service of the government of this State to coöperate with the said Board of Commissioners in collecting and arranging for exhibition such material as may be available for display in illustration of the methods employed and results achieved in their respective lines of official duty, and, if so required by said Board of Commissioners, they shall furnish complete catalogues, direct the installation, assume the immediate care, while on exhibition, and cause the removal of their respective exhibits at the close of said World's Columbian Exposition, in accordance with the requirements of the management of the same. The said Board of Commissioners is also hereby authorized to accept loans or donations, and, with the approval of the Governor, to acquire, by purchase, for the State, specimens and material, if deemed necessary, to supplement any of the said departmental exhibits.

"SEC. 4. Consent of the General Assembly is hereby given that there may be placed on exhibition, as part of said *collective exhibit*, in a suitable fire-proof structure to be erected for the purpose, such relics and trophies belonging to and in custody of the State as the Governor may designate; the same to be and remain at all times, during their removal, while on exhibition, and during their return to their present depository, in the sole care and charge of their official custodian."

A full and proper execution of the foregoing descriptive provisions of the law could not fail to result in the collection and installation of an exhibit fairly and intelligently illustrating:

1. *The Principal Functions of a State Government*, as distinguished from those of the Federal Government of this Republic.

2. *The Institutions Established* and the agencies employed, the methods of their operation and results attained since the organization of the State Government, for the promotion of the moral, educational and material welfare of all its citizens alike.

3. *The Natural Resources* of our territory and, approximately, their extent and available value in contributing to the comfort, prosperity and wealth of our people.

4. *The Physical Conditions* which nature has established for the State of Illinois dominating the practice of rural husbandry throughout and for all time.

5. *The Rate of Growth and Development* of this State in population, commerce and productive industry from its organization in 1818 to 1890.

Such, in brief, was substantially the task imposed upon the Illinois Board of World's Fair Commissioners. To pay the necessary cost of work contemplated, the sum of \$680,000.00, or so much thereof as might be necessary, was appropriated by the same act. The next succeeding General Assembly (38th), with the approval of Governor Altgeld, reduced the available sum to \$608,500.00

On its organization, July 1, 1891, the Board chose to exercise the discretion allowed by the law and honored me with the position of Director-in-Chief, at the same time charging that officer with "such supervision, direction and control of the operations of the Illinois Board of World's Fair Commissioners as will tend to promote the efficiency of every agency employed," and instructing him "to assume and exercise all such executive powers and functions as shall be necessary to secure promptness, efficiency and good faith in every depart-

ment," being "at all times and in all respects subject to the direction and control of the Board."

Having been personally instrumental in the preliminary work of framing the bill and urging its enactment by the General Assembly, I entered upon the discharge of the duties to which I was thus assigned with a deep sense of responsibility, and also, I trust, with a correct conception of the relations of the Board to the elementary agencies through and by means of which the proposed "collective department exhibit" must, if at all, be made. It was realized that the State Government in most of its departments was to be placed in evidence before the world, that the service and functions of each department were special, and demanded in their several officers special qualifications; that except in the sections of the proposed exhibit embracing the products of the farm, orchard and garden, none but the scientist, the educator and the expert could be safely trusted to prepare the plans, to dictate the selection of material and to direct the installation.

#### **State Institutions Participating.**

The State Institutions, Boards and Departments *proper* which, by the nature of their service and methods of work, were in position to make acceptable exhibits are:

1. Institution for the Education of the Deaf and Dumb—Jacksonville.
2. Institution for the Education of the Blind—Jacksonville.
3. School for Feeble-minded Children—Lincoln.
4. University of Illinois—Champaign.
5. State Laboratory of Natural History—Champaign.
6. State Entomologist—Champaign.
7. Experiment Station—Champaign.

8. Geological Survey—Springfield.
9. State Museum of Natural History—Springfield.
10. State Normal University—Normal.
11. Southern Normal University—Carbondale.
12. Railway and Warehouse Commission—State Grain Inspection—Chicago.
13. Department of Public Instruction—Model Common School-room—Springfield.
14. Fish Commission—Springfield.
15. Relics and Trophies—Adjutant-General, Custodian—Springfield.

The foregoing agencies of the State Government are severally in direct charge of officers (elective or appointive by law) and employés who receive compensation in whole or in part from the State treasury or from the proceeds of their special service, as in the inspection of grain. As a rule their time is fully absorbed and their energies fully taxed in the performance of their daily routine of official duty. Section 3 of the law before quoted received a construction, to which, however, I never fully assented as just, precluding the payment by the Board of any compensation for the extra and exceptional service demanded of them in their work of coöperation. It is only affirming the public judgment of those functionaries to so say that, in the lines of their official duties, no more competent, better equipped or patriotic body of men ever served a State; and it is a pleasure to record the fact that, without exception, they responded to the appeal of the Board, accepted the onerous exactions without protest, and entered at once upon the labor of preparation. The most cordial relations were established and, in due time, their several plans for exhibition, installation and supervision with estimates of cost, were presented. In every instance these bore the evidence of careful, intelligent deliberation, a broad and clear comprehension of the spirit and

requirements of the law, and a just sense of the responsibility resting upon them. They knew, and it is to be assumed that the Board recognized the fact that, within the scope of their several departments, they and they alone could intelligently dictate and properly execute the work required by their several exhibits; that upon themselves primarily must depend the substantial character of the State exhibit as a whole, and that to them would be largely due the honor of success or the dishonor of failure, provided only their efforts and plans were not thwarted by causes beyond their control in the matters of cost and allotment of space for display. Their original plans and subsequent correspondence are on file for preservation and reference, and when their several reports shall be in the archives of the State their record will be fully made up.

I do not care to comment here on this branch of the State exhibit further than to express the opinion that if in any of these exhibits, when finally installed, there was manifest any want of completeness in material or representative character, no just censure can properly attach to any officer or employé of the State government.

### **Other Sections.**

Aside from the foregoing strictly governmental exhibits, and, in some instances, supplemental to them, other important displays were made by direction of the Board, in accordance with specific requirements of the organic law. The most important of these were the following:

#### **1. Public Common Schools.**

The methods and results of educational work as pursued in the Public, Technical, Art and High Schools of the State.

The official duties of the State Superintendent of Public Instruction precluded the possibility of that officer giving any attention to the organization of this most important exhibit, except by counsel and suggestion, and with the approval of the Board, Prof. Wm. Jenkins, of Mendota, was induced to accept the position of Superintendent. In that gentleman were found combined the qualifications of ripe scholarship, thorough familiarity with the subject through many years of experience as a teacher and superintendent of schools, a wide and favorable personal acquaintance with educators of every class, and executive ability of high order. The State Teachers' Association, of which he held the secretaryship, approved the selection without reserve, and at once the most cordial coöperation of every educator in the State was assured.

The result was exactly as anticipated. A great wealth of material, intelligent discrimination in the selection and perfection of systematic arrangement, gave us an exhibit truthfully representative of pupils' work in every grade of the public common school system throughout the entire State. Supplementing the kindred exhibits by the two Normal Universities and the University of Illinois, it rounded out the educational feature of the State exhibit, and rendered it a source of just pride and congratulation to every citizen intrusted in the work and mission of the "Little Red School House" in America.

## **2. Relief Map of the State.**

A literal, full compliance with the provision of the law relating to topography would have required the Board to conduct a general topographical survey, for the proper accomplishment of which there was neither the necessary time nor funds. Hence it was decided to proceed no further in that direction than the construction of a Relief Map of the State.

Fortunately, Prof. C. W. Rolfe, an accomplished civil engineer, and also professor of geology in the University of Illinois, consented, chiefly as a "labor of love", to organize and direct the necessary survey and the construction of the map. A corps of assistants, some of whom had been pupils of the University, were selected by him and placed in the field. He was entirely familiar with this delicate and difficult work, was already in possession of much valuable data, and the time being limited, was able to press the survey to completion as rapidly as was consistent with careful regard for accuracy. There is no reason to question the correctness of the observations as reported by his assistants, and the data obtained may, if occasion should offer, doubtless be safely relied upon in connection with a more extended survey at some future time. Already the publishers have utilized the data thus obtained in the correction of many errors existing in previous editions of State and county maps.

### 3. Archaeology.

The certainly of limited time and of large expense in conducting the exploration of mounds conspired to circumscribe the work of discovery in that direction. The collection already in the State Museum was made the basis of the exhibit in this section. To this were added, chiefly by purchase, many specimens found on the surface of the ground in all parts of the State.

Prof. William McAdams, of Alton, Geologist and Archæologist, with much experience in this department of science, and residing near one of the most interesting and extensive groups of mounds in the world, was engaged to direct the work of collection. Limited operations among a few of the most promising mounds in appearance were rewarded by valuable results, which his report details in full, and which are certainly encour-

aging to future effort. Surface collections possess little scientific interest as compared with those from the mounds, because they are not necessarily and generally not at all characteristic of the locality where found, but they are desirable in museums, and are fast disappearing through the industry of commercial collectors and dealers.

The Federal Government, through the intelligent direction of the Smithsonian Institute, is pursuing a systematic exploration of the mounds of the United States, which will, ere long, invade the territory of this State, and absorb for the National Museum such relics as our mounds may give up, unless that work shall be anticipated by a State survey of the same character.

#### **4. Agriculture, Horticulture and Floriculture.**

With the main specific purpose of illustrating the climatic conditions of this State, as they relate to and effect rural husbandry throughout our nearly four hundred miles of latitude, the law required a full and complete display of all the cultivated products of the several branches of agriculture, farm culture, horticulture and floriculture. To facilitate operations, the display was divided—farm products constituting one section, horticulture and floriculture the other. With the approval of the Board, Commissioners Vittum and Chester were assigned to the superintendency of the former, and Commissioners Pullen and David to the superintendency of the latter. Owing to the delicacy of the material, and the difficulty of transporting plants and flowers, a professional florist, Mr. John C. Ure, of Chicago, was engaged to make the floricultural display. His exhibit was eminently beautiful, artistic and profuse, and was admirably maintained from the opening to the close of the Exposition.

In the sections of the farm products and horticulture, no descriptive words can do justice to the intelligent,

conscientious and successful labors of the gentlemen who personally, and with the aid of competent assistants, selected by themselves, conducted the work of collecting and installing these displays. The stated purpose of the law was strictly complied with. Abundant material truthfully represented the varied and varying production of every section of the State throughout the entire season of growth. The installation was systematic, and pervaded by decorative forms which challenged the admiration of every visitor, and early became a well known, attractive feature of the Columbian Exposition. As a whole and in detail, they afforded a wealth of practical information in regard to rural husbandry in Illinois which could not be otherwise or elsewhere obtained. Their catalogues and records are fully made up, and possess an enduring value.

### **5. Architectural Drawings.**

In framing the provision of the law relating to architectural drawings of State buildings, it was assumed, without inquiry, that in case of every important building erected by the State, the original drawings and specifications used in letting contracts, or copies of them, were in possession of the State, or otherwise obtainable. On discovering such not to be the fact, and that a strict compliance with that provision within the time available would involve the necessity for the expenditure of a very large sum, it was thought best to substitute photography. A full and complete series of large and first-class photographs, representing all public State buildings, with many views of interior rooms and of surrounding grounds, was executed and appropriately installed for exhibition. The effect was, in all respects, satisfactory, while the cost, compared with that of architectural drawings, was nominal only.

## 6. History and Statistics.

The direction of this work was placed in the hands of the Secretary of the Board, under whose instruction a synopsis of the civil history of the State has been prepared. Statistical tables have been compiled, showing the progress and growth of the State, by counties, in population and industrial development, by decades, from the date of its organization (1819) to the year 1890, so far as correct data proved to be available. A correct map of each county now organized, is included in this compilation, which is full of facts interesting to every intelligent citizen of the present day, and will, doubtless, form the reliable basis of a similar compilation to be prepared by our successors for the World's Columbian Exposition of 1992.

### In Review.

As a member, and its chief executive officer, my duties held me to a qualified responsibility in connection with every act of the Board in all its relations, particularly from the date of its organization to the close of its preparatory work on the opening of the general Exposition May 1, 1893, necessarily, during this term conducting its important correspondence with all outside organizations and individuals, and being present as a representative at all interviews and conferences involving its interests and policies. This intimate and continuous relation with the transactions of the Commission seems to require of me in this report at least a brief reference in review of the work which has been accomplished.

The vital question which has been asked, and which will be asked again and again is: Has the participation of the State of Illinois in the World's Columbian Exposition, so liberally provided for, substantially fulfilled its purpose?

With a full knowledge of what has been done and of the conditions under which it has been accomplished, and assuming to speak only in regard to the Exposition itself, I do not hesitate to reply in the affirmative.

The law which prescribed and mapped out the work of the Board was, as nearly as possible, exhaustive in its requirements and without precedent in its aims and purposes. The field was large and its path untrodden. No single citizen of the State possessed that comprehensive and definite information which justified him in deciding in advance just what showing should be or could be made within the lines laid down, nor, of course, even approximately fixing the cost. In illustration of this uncertainty it will be remembered that the original estimates aggregated \$987,000.00; that the available sum of the appropriation was finally reduced by legislation to \$608,500.00, and that of this sum, at the close of our labors, there remains an unexpended balance of about \$83,000.00. A similar uncertainty pervaded others than the financial department, and, necessarily, more or less modified, if it did not embarrass, the efforts of some of those engaged in preparing their exhibits. Nevertheless, while it would be idle to claim that no error of commission or omission attended the execution of the task assumed by the Board, while looking back it is now clear that in some of the departments the displays might have been more nearly complete, more valuable and more fully representative, it is safe to say that, as a whole, the result was creditable to the great State for which it stood before the world, and that it presented to the mind of every thoughtful citizen and visitor, however intelligent, a new fund of useful, practical information far beyond any just estimate of financial value. Reference has not been made to the construction, transportation or financial departments for

the reason that they were in charge of members having ample and far more experience in those affairs, and because other duties seemed to require, as they certainly received, my conscientious and unremitting attention during my official term.

In obedience to the instructions of the Board, and just previous to the public openings, I assigned to special duty and continuous service during the full term of the Exposition, in connection with the care of the exhibits, building and personal property, members of the Board who were willing to accept such duty. I also presented an estimate of the force of employés required for the same term, and apportioned their selection among the members so that every congressional district might have an equitable share of such appointments.

With the force thus fully organized for the remaining six months' campaign; the work of collecting and preparing material for exhibition in the several departments substantially completed, save only in those of farm products, horticulture and floriculture, which were fully assured; with the installation also substantially complete; with a board of twenty-one members regularly organized, and to receive monthly salaries for continuous service, and with no apparent further executive duty to be performed which did not properly belong to the functions of a regular presiding officer, I embraced the very welcome opportunity to tender my resignation as Director-in-Chief on the 1st day of May, 1893, in the consciousness of having endeavored, at least, to discharge my whole official duty to the people of the State, to the several exhibitors and to the Board.

Respectfully,

JOHN P. REYNOLDS,

CHICAGO, May, 1894.

*Director-in-Chief.*

## REPORT OF COMMITTEE ON CONSTRUCTION AND INTERIOR FURNISHING.

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**T**HE Committee on Construction and Interior Furnishing respectfully submit their final report:

The members of the Illinois Board of World's Fair Commissioners met at the Sherman House in Chicago, on the 1st day of July, A. D. 1891, and organized by electing a President, Vice-President, a Secretary and a Director-in-Chief, and providing for thirteen standing committees, to be appointed by the President, the first and chief of which was the Committee on Construction and Interior Furnishing of the Illinois State Building.

This committee was originally composed of John Virgin, Chairman, Pace, Pearce, Pullen, Bradley, Vittum, and Judy, and J. M. Washburn was afterwards added by an order of the Board; and Secretary Garrard was made clerk of the Committee.

On the 5th day of August, W. W. Boyington & Co. were employed as architects, to prepare and furnish plans and specifications for the Illinois Building in Jackson Park, and to supervise the construction, erection, repairing, taking down and removing it, for a gross sum of \$11,500.00.

The plan of the building, made by the architects, approved by the Committee and adopted by the Board, was for a main building 450 feet long, east and west, by 160 feet wide, north and south, three stories high across each end, with a main entrance at the middle of each end, with a dome in the center of the building 75 feet in diameter, built up from the foundations of the building, to the height of  $235\frac{1}{2}$  feet, and surmounted by a flag pole 40 feet above the dome. At the center of

the south side of the main building is a projection or wing 121 feet long, east and west, by 75 feet wide, north and south, also three stories high, with a main entrance at the middle facing south. Also a projection or wing at the middle of the north side two stories high and 75 feet long, east and west, by 50 feet wide, north and south, with a main entrance at the middle facing the north.

This north wing is also called Memorial Hall, and was made a fire-proof building. The main building, except 30 feet across each end, which is three stories high, is built two stories, the floor of the second story consisting of two large galleries, each 16 feet wide, running from one end of the main building to the other, with an open space between them 32 feet wide, and between these galleries and the north side and south side walls of the building are open spaces, each 48 feet wide.

The foundations of the main building and south wing are of wood placed on sand, and the walls are of wood and mortar covered with staff.

The foundations of the north projection are of heavy timbers; the walls are of brick and mortar, also covered with staff, and the girders and roof are iron.

That part of the dome below the roof of the main building is made of timber and mortar, covered with staff. That part above the roof is made of iron. The joists, girders and stairways in the building are made of wood. The roof is made partly of glass, partly of iron and tin and partly of gravel.

The contract for furnishing the material and erecting the building complete and keeping it in repair till the end of the Exposition was let by contract to the lowest bidder, after advertising the time, place and terms for thirty days in the *Herald*, *Inter Ocean*, *News*, *Tribune* and *Times*.

The bids were opened by the Board of Commissioners in session, on the 18th day of November, A. D. 1891, when it was found that there were quite a number of bids for the several parts of the work, and one bid of \$195,800 for the entire contract. This bid was by William Harlev & Son.

After persistent opposition and much consequent delay, the contract was awarded to William Harlev & Son on their said bid, it having been ascertained that the lowest aggregate of the other bids was \$204,278.

During the progress of the building a number of changes were made, some involving an addition to, and some a deduction from, the original sum contracted for, and some extras were incurred, adding to the original price of the building; for all these we refer to the final report of the Committee on Finance.

The building was accepted and occupied by the Board of Commissioners on the 15th day of February, A. D. 1893.

### **Interior Furnishings**

Were made from time to time, as their necessity became apparent.

An ornamental fountain or grotto for drinking water was erected in the center of the base of the dome and furnished with two faucets on each of its four sides by J. B. Mora, under a contract for \$1,500. At this fountain pure cool water filtered by the Pasteur system by Brooks & Clark for \$1,600, was furnished free to all the millions who admired and patronized it.

In the fish department a grotto, with cavern forming a mountain scene, with a lake at the mountain base and streams running from the lake, was made by J. P. Mora for \$1,750. The water used in the Fish Exhibit was filtered by the Jewel Filter Company without cost to the Board.

For the use of the agricultural exhibit a pagoda or pavilion was erected in the Illinois Building by Wharton, English & Co., and a like pagoda in the Agricultural Building by the same persons. They also built pyramids, tables, cases, etc., for these agricultural exhibits.

In the horticultural department in the Illinois Building they built the tables on which the horticultural exhibits were displayed. There were a number of long, plain tables and also a number of pyramidal tables surrounded with railings, and on which the horticultural exhibits were tastefully displayed.

In the grain inspection department there were built a car-box, an office, a number of grain bins and ornamental work, and lettering on the wall showing the amount of business by the Grain Inspection Department in the year 1892.

#### **Forestry Exhibit.**

For the better display of the forestry exhibit, there was erected a platform on which was exhibited 25 different varieties of cultivated woods, inserted into a highly ornamental farm wagon. Also, frames were built in rustic work, in which were placed the specimens of both the native and cultivated varieties of trees and shrubs grown in Illinois. Also, a very ornamental rustic framework in front of the forestry exhibit.

#### **Clay Exhibit.**

A pyramidal platform was built for the accommodation of the brick, tile, terra cotta and ornamental clay exhibits.

#### **Geological and Archæological Exhibits.**

For these exhibits there were furnished, by the Grand Rapids School Furniture Company, 21 geological cases, each 15 feet long, 5 feet wide, and 52 inches high.

One upright archæological case, 17 feet long, 8 feet high, and 12 inches deep, and two hexagonal stands for building stone. The cases were covered with sash filled with American plate glass, and the contract price for all was \$2,205.43.

### **Exhibits of Natural History.**

The following lists of furniture made at the University, was paid for by this Board:

75 feet insect cases, 1 table, 2 gauze frames, 1 microscope table, 1 table and office catalogue, 60 insect boxes, 1 tool and supply case, 1 stand table, 30 feet shelves for insects, 1 table, 1 book-case 4 feet 6 inches, with curtain, 1 book-case, 40 inches, with curtain, 1 case of drawers, 1 table for gas stove, 36 feet book shelves, 150 feet wall cases, 1 case for birds' eggs, 1 case for wild turkeys, 1 case 45x45 inches, 4 cases (C. F. E. D), 41 feet double cases, case No. 1, detail sheet 7; case No. 2, detail sheet 7; case No. 3, detail sheet 7; 1 table swing shelf, detail sheet 7—a total charge of \$1,592.60.

### **Post Office.**

There was furnished a post office, located on the right of the south entrance to Memorial Hall, consisting of pilasters, counters, cornice, doors, 80 call boxes, a general delivery for papers, a letter case and delivery wicket. Also parcel bins, filling the rear wall space to the height of 11 feet. Also, 1 work table 2x3 feet, 1 office chair, 1 stool and 1 step-ladder. Also, 2 receptacles for canes and umbrellas of 45 capacity each. Also, a nest of latest improved patterns, placed in window, consisting of 72 No. 1 and 16 No. 2 boxes—all for \$290.80. This outfit was returned under contract at 40 per cent. of the cost.

### **Precautions Against Fire.**

For the purpose of extinguishing any incipient fires, there were purchased and placed in the building 1,750 feet of water hose, with reels and nozzles, at a cost of \$1,276. Also, there were hired 25 Babcock Fire Extinguishers, and placed in convenient parts of the building, ready for instant use on occasion, at a rental of \$375.

### **Lights.**

The Illinois Building was furnished with 71 arc lights and a number of incandescent lights during the latter part of the Exposition, for the cost of which we refer to the report of the Committee on Finance.

### **Heating.**

The south projection of the building was heated by steam by the Detroit Heating and Lighting Company at a cost of \$975.00.

### **Interior Decorations.**

The following rooms in the south projection were decorated by the Chicago Carpet Company for the sum of \$1,500, to-wit:

S. E. reception room and council chamber, S. W. reception room and three other rooms connected therewith, including the general reception room and the ladies' national commission room.

### **Seats.**

There were 250 settees provided for the public use from 5 to 10 feet long, capable of seating 1,250 or 1,500 persons.

### **University of Illinois Furnishings.**

1. A plain table with case resting on table covered with glass in front, with two movable shelves.

2. A square glass case resting on floor with sash.
3. Two tables, 7 feet and  $11\frac{1}{8}$  inches long, with one row of drawers full depth of tables.
4. A case adjoining No. 3, 14 feet long with glass doors in front and with a continuous, movable shelf on top.
5. Case, 6 feet long, same as No. 4.
6. A continuous table and case with glass front and one movable shelf.
7. A glass case resting on the floor, provided with three shelves.
8. A glass case, 7 feet  $1\frac{1}{4}$  inches by 11 feet 4 inches, same as No. 7, but no shelves.
9. A glass case 2 feet  $\frac{1}{2}$  inch by 11 feet 4 inches, with three movable shelves.
10. A plain table with drawers, 4 feet by 8 feet.
11. Two plain tables of different heights, with show case on the higher one.
- 12, 13 and 14. Three glass cases resting on the floor, all the same height but of different sizes.
15. A case with solid panel doors underneath and movable shelves and glass doors above.
16. A case in two sections, one upon the other, with glass doors across the front and movable shelves 6 inches apart from top to bottom.
17. A table with show case on top and with two drawers and paneled door underneath on both sides for closet.
18. A long table cut to fit round a part, with various large and small drawers and doors for closets.
- 19 and 20. Two high upright cases with glazed doors.
21. A case and cabinet with drawers and cupboards.
22. A plain table with standard show case on top.
23. Two upright cases with glass doors and movable shelves.

24. One upright case, glass all around upper part; solid panels below; inside of upper part built up with pyramid shelves.

25. A desk for the study of chemistry.

26. Four upright cases, glass doors in front, provided with movable shelves.

27. Four tables and cases.

28. Work bench, provided with drawers, shelf and cupboards.

29. A case of cupboards.

30. A case of drawers.

31. A heavy work table.

32. An upright case resting on floor, glass sash all around and glass top; inside a pyramid of shelves.

33. An upright case, with glass sash in front ends and on top; inside a pyramid of shelves.

34. Two cases paneled underneath and glass doors above with movable shelves.

35. Case with glass sash all around.

36. Case with glass on three sides and top and two front doors.

37. A desk with show case top; desk part provided with drawers.

38. A glass cabinet with show case on top.

39. An upright case with glass doors and drawers below.

40. Two upright cases with glass sash all around.

40A. A common table.

41. A desk with two glass doors and with cupboards.

42. A high upright case with glass sash front.

43. A case of cupboards with three front doors; inside in two sections, one section provided with four stationary shelves.

44. A high upright case resting on the floor, glass sash all around.

45. Two cases of cupboards with four doors in front and one fixed shelf.

46. Three tables with vertical walls attached.

47. A glass case with solid inclined top doors in front and rear; two stationary shelves.

48. Consists of six tables.

49. A continuous table with drawers and cupboards, with glass case on top.

50. A cabinet and case; the lower part with drawers and cupboards, the upper part with glass fronts and inclined tops.

51. A square case with inclined top and doors on one side.

52. A table.

53. A table with show case on it.

54. A table with show case on it.

55. A table with show case on it.

56. A table with show case on it.

57. An upright case with glass sash on three sides.

58. A cabinet and case like No. 50.

59. An upright case; glass front and ends, with movable shelves.

60. Three cases with show case tops; tops, ends and fronts glass.

61. A case of two tables and show cases; tables provided with center parts; cases have inclined tops and glass on all sides and tops.

62. An upright case with door in front and glass all around and movable shelves.

#### **Illinois Normal Universities.**

Your committee have no data from which to give the different articles of furniture or furnishings in or on which was displayed this exhibit.

We can only say that each of these Universities was furnished such tables, cases and furniture as they required.

The furniture and furnishings for the Illinois State Normal University, were made and delivered by Kelly Brothers' Manufacturing Company for the sum of \$1,167.00.

And for the Southern Illinois Normal University, by Kelly Brothers' Manufacturing Company, for the sum of \$1,377.20.

For the display of the exhibits of the public schools all the furniture, tables, cases, screens, etc., which were required by the superintendent of that exhibit, Prof. William Jenkins, were made and delivered by Kelly Brothers' Manufacturing Company for \$2,085.00.

The furniture and furnishings of the several educational exhibits occupied a large and prominent space in the building, and with the exhibits attracted much of the attention of visitors.

The various offices and reception rooms were furnished with carpets, window shades or curtains, desks, tables, chairs, sofas or lounges, washstands and other conveniences, and some of them with stoves, the cost of which will be found in the report of the committee on finance.

JOHN VIRGIN,  
J. IRVING PEARCE.  
B. PULLEN,  
D. W. VITTUM,  
E. C. PACE,  
JAMES M. WASHBURN.  
LAFAYETTE FUNK.

*Committee.*

## REPORT OF THE COMMITTEE ON GROUNDS AND EXTERIOR ORNAMENTATION.

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THE grounds surrounding the Illinois State Building for lawn purposes embraced about two and one-half acres. The extent was two or three times that of any other State Building. The location rendered necessary much heavy filling to bring to grade, especially on the north side—the north annex extending into the lagoon. After bringing into grade, and to complete the preparation of the ground for sodding, etc., there was added from four to six inches of well fertilized soil, made necessary by its complete absence, there being little else than sand. Handsome shade trees were already upon a part of the grounds. Some of these had to be removed, and they with others were distributed over the entire lawn.

The general purpose and desire being that the lawn and its appointments should be in keeping with the building and its surroundings, special efforts were made to accomplish this purpose. The approaches to the building from the National roadways—the one from the south being 60 feet and the one from the west being 50 feet wide—were laid with Illinois paving tile. On each side of these walks were placed large rustic benches for the accommodation and comfort of the general public. On the north side of the building and next to the lagoon were built a gravel walk and roadway extending the entire length of the building, connecting with the National roadways on the east and west. This roadway was 12 feet in width by nearly 600 feet in length. The balance of lawn was carefully sodded, requiring between 8,000 and 9,000 square yards, all being inclosed with steel posts and chain for its protection.

In the fall of 1892 a number of tulip beds were located, prepared and planted in variety. These furnished not only beautiful flowers, but a delightful contrast for the spring and early summer of '93, and being succeeded by cannas in large variety, the beds were thus continued until the close of the Exposition. In addition, palms, shrubs and flowering plants were distributed over the ground for a relief, adding much to its general appearance. It was designed to introduce a few rockeries for ornamentation, but instead coal pyramids were substituted, not so much for their beauty, but as a practical demonstration of the value of the coal fields underlying the great State of Illinois. One of these pyramids showed the vein of coal to be 10 ft. in thickness. On the south front in the center of the walk leading to the main entrance was located a piece of sculpture called "Hide and Seek," David Richards, of Chicago, artist, which, for artistic excellence, was certainly not equalled by any similar work on the grounds of the Exposition. The plans and specifications of the building called for statuary at the entrances. Early in 1892 the commission decided to substitute for these, plants, flowers, vines, etc. The platforms on either side of entrances were converted into rockeries mingled with soil, into which grasses, ferns and running vines were planted, the whole being surmounted with palms and other rare plants, producing a beautiful and highly artistic effect. The decision of the commission also included the interior of the building, which was beautifully decorated throughout with hanging baskets, flowering, foliage and other plants. We think the commission made no mistake in deciding upon this change, as it seemed to give general satisfaction, and elicited many favorable comments. No other building upon the grounds of the Columbian Exposition was similarly decorated, and the

cost, including care, will not equal one-fourth the cost of statuary. We feel that our lawn was "a thing of beauty," and only wish that it could have remained "a joy forever". The committee on "grounds and exterior ornamentation" were supposed to have \$10,000.00 for their use, including care and maintenance during the six months of the Exposition.

The finance committee's report will show that less than half of this amount has been expended, and we feel confident that the Commission and general public feel satisfied with the work that has been done.

B. PULLEN,  
SAML. DYSART,  
A. B. HOSTETTER,  
W. H. FULKERSON,  
S. W. JOHNS,

*Committee.*

## REPORT OF COMMITTEE ON ARCHITECTURAL DRAWINGS, TOPOGRAPHICAL SUR- VEY, MAPS AND DRAWINGS.

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**T**HE work assigned to this committee, under the direction of the Commission, is outlined in the third article of the second section of the statute creating the Commission.

### Public Buildings.

On investigation, the committee learned that but very few of the original architectural drawings of the several State institutions had been preserved, and to make new measurements of the buildings would be very expensive and impracticable.

To make drawings with a reasonable degree of accuracy, photographic views would have to be depended upon as the basis of the work.

By the process of enlarging photographs to any desirable size, it was found that the buildings and grounds of the institutions could be shown as correctly, and at much less cost than by drawings. By coloring these views by hand-work, a more natural representation was produced, and a more attractive picture the result.

The committee, deeming that plan the most practicable means of executing the law, adopted the method, and procured the service of a competent photographer, who visited all the institutions and made photographs of them. From these pictures were made, varying in size from 4½ to 6 feet in length, according to the size of buildings and grounds, of all the State institutions, as follows:

University of Illinois, at Champaign.

State Normal University, at Normal.

Southern Normal University, at Carbondale.

Northern Hospital for Insane, at Elgin.  
 Eastern Hospital for Insane, at Kankakee  
 Central Hospital for Insane, at Jacksonville.  
 Southern Hospital for Insane, at Anna.  
 Institution for the Education of Blind, at Jacksonville.  
 Institution for the Education of the Deaf and Dumb,  
 at Jacksonville.

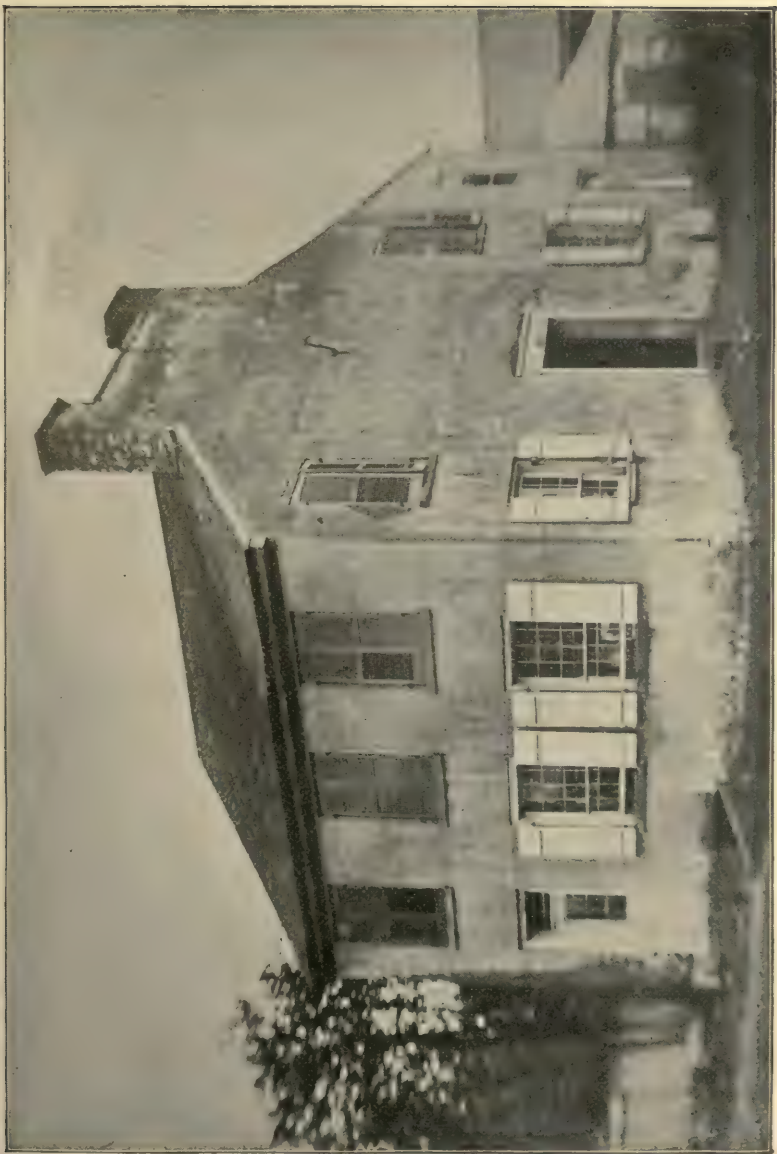
Asylum for the Feeble-minded, at Lincoln.  
 Soldiers' and Sailors' Home, at Quincy.  
 Soldiers' Orphans' Home, at Normal.  
 Eye and Ear Infirmary, at Chicago.  
 Reform School, at Pontiac.  
 Northern Penitentiary, at Joliet.  
 Southern Penitentiary, at Chester.  
 Penitentiary for Insane Criminals, at Chester.  
 State House, at Springfield.

State Building, World's Fair Grounds, at Chicago.

To preserve the form for the future, and to show the prosperity of our State as shown in its Capitol buildings since the admission into the Union, it was decided to enlarge a photograph that was obtained of the first State House at Kaskaskia, where the first session of the Legislature was held in 1819. Also, the second State House, at Vandalia, which was used for twenty years. The third State House, at Springfield, which was used until the present Capitol building was constructed.

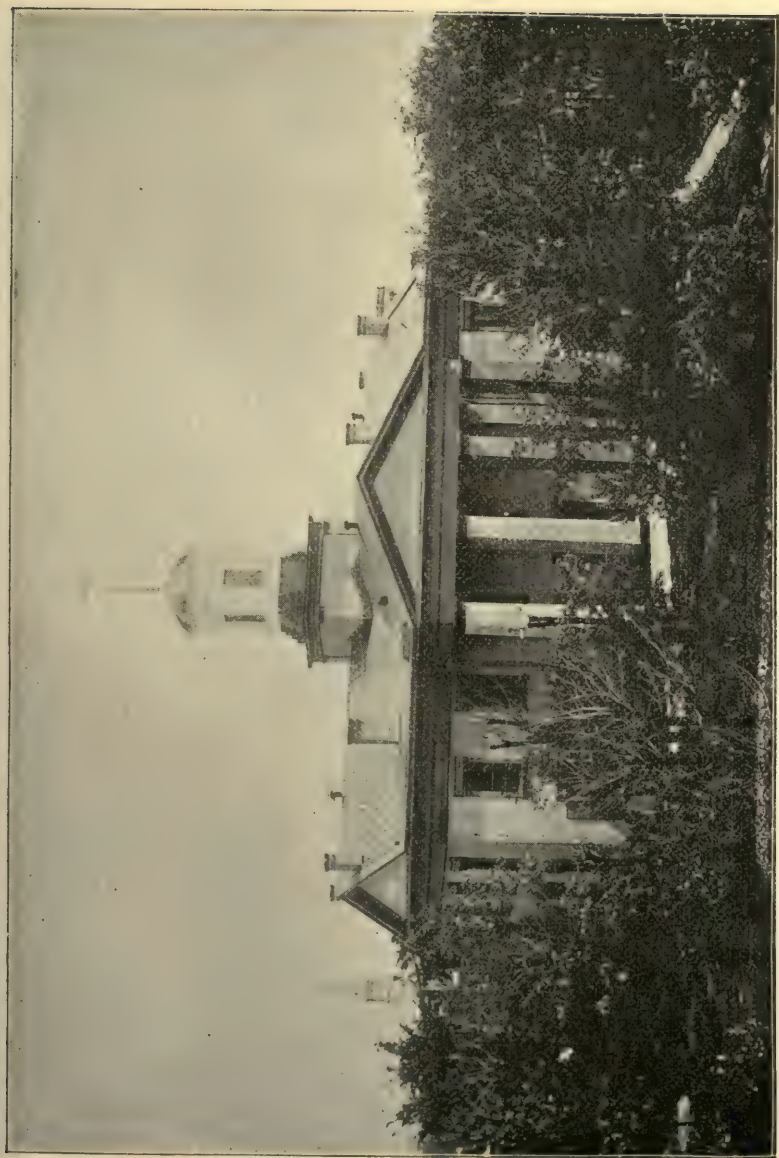
The pictures were well framed and glazed, and exhibited on the gallery of the building.

The collection was an interesting exhibit to visitors from home and abroad. It illustrated the progress, wealth and prosperity of our State by sight. They showed how freely our taxpayers had contributed to the cause of education, and the greatest of all virtues, charity, in caring for its afflicted and unfortunate citizens, for its aged and enfeebled soldiers, and in protecting society from the destructive liberty of criminals.



ILLINOIS STATE HOUSE, KASKASKIA.





ILLINOIS STATE HOUSE, VANDALIA.



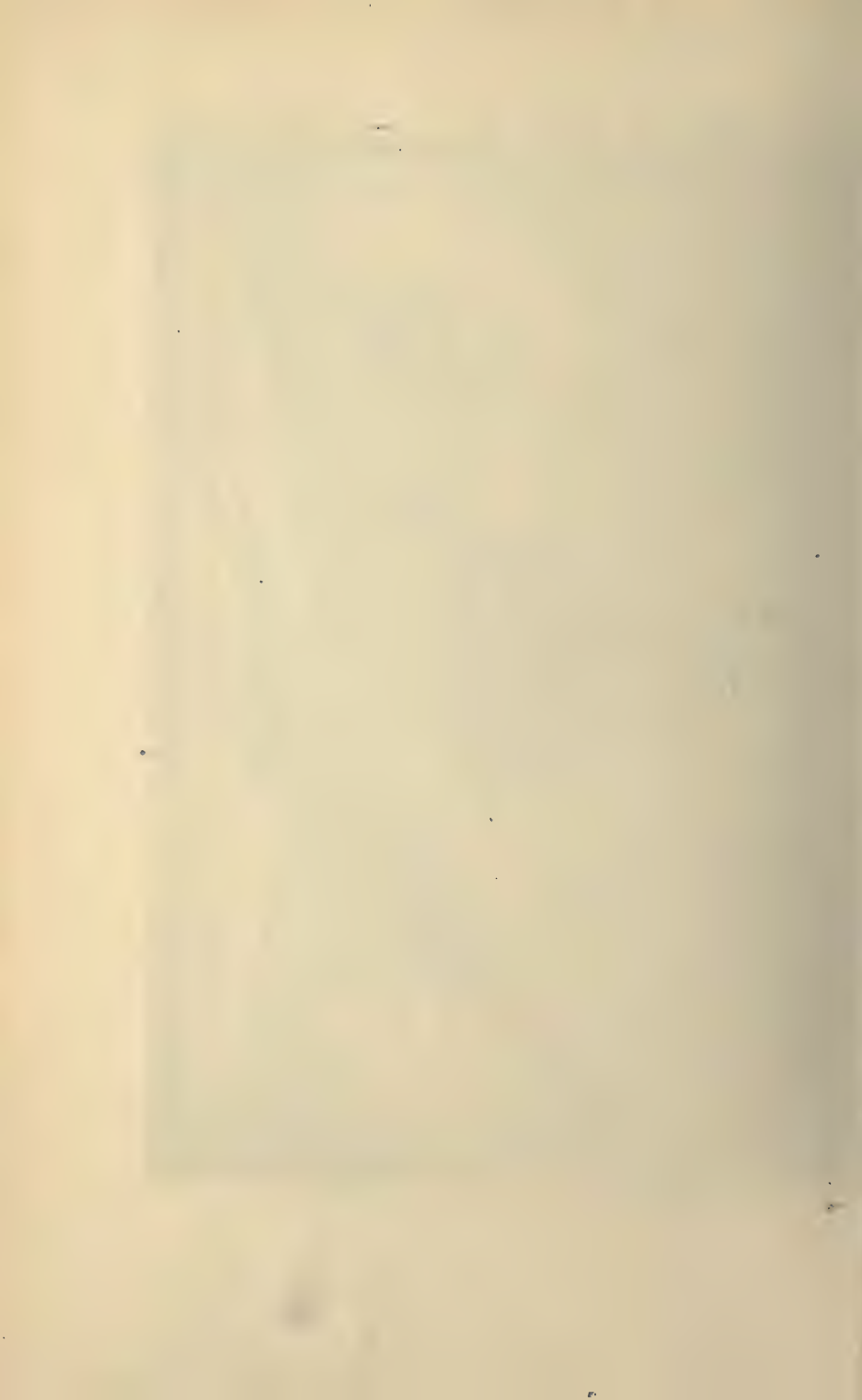


THIRD STATE HOUSE, SPRINGFIELD.





PRESENT STATE HOUSE, SPRINGFIELD.





RELIEF MAP OF ILLINOIS.



### Relief Map.

The best method of illustrating the topographical features of the State was a subject of much deliberation by the Commission.

It was decided that the most intelligent and interesting profile of the surface could be made by the Relief Map modeled from a survey of the State. The scale of measurements adopted for the map was two miles to the inch horizontally and 500 feet to the inch vertically.

The surface of a large portion of the State being comparatively level, without sharp elevations, an exaggerated vertical scale had to be used in order to make a good representative form of the surface as it really exists.

No topographical survey of the State had ever been made; hence there were no data in existence for such a work further than that furnished by the base lines of the Government survey and the survey of the different railway lines in the State.

Not having the necessary time or means to make a complete topographical survey of the State, the committee decided, in addition to those surveys mentioned, to have made topographical observations by counties, with barometers and levels in the hands of surveyors who traversed the counties in different directions by private conveyance.

That work was executed at considerable expense, but the committee feel assured that the important data thus secured will more than compensate the State for the expenditure.

C. W. Rolfe, of Urbana, professor of geology in the University of Illinois, was employed to superintend and direct the work, and the committee have reason to believe that it was done with as much care, accuracy and economy as possible under the circumstances.

The following is a synopsis of data upon which Prof. Rolfe directed the survey. From the Mississippi River Commission a line of levels from Cairo to Dunleith, a line of levels from Fulton to Chicago, along the Chicago, Milwaukee and St. Paul Railway, a series of topographical charts of the Illinois shore of the Mississippi and the low water slope of the Mississippi.

From the lake survey a series of geodetic stations between Chicago and Olney.

From the Illinois and Michigan Canal low water levels of the Illinois River.

From United States Geological Survey a series of topographical charts between Chicago and Peoria.

From the coast and geodetic survey a line of levels from Olney to St. Louis, a line from Centralia to Cairo and low water levels of the Ohio and Wabash Rivers.

From United States engineers the preliminary survey of the Hennepin Canal.

From the railroads profiles of their lines.

Barometric profile made with moving and stationary barometers of such railroads as had no profile.

The bench marks of the lines of levels and geodetic stations were connected with the nearest railroads, and were used to correct the profiles of such railroads.

The elevations above low water of the railroad bridges over the Illinois and Mississippi rivers were obtained, and the railroad profiles checked by them.

The exact relations of the railroads at intersecting points were ascertained, and the profile of the roads checked on each other, using those that had been corrected by United States data as master systems.

To the outline so established the details of surface in the different counties were added by traverses with barometer and hand level arranged to intersect railroads as often as possible, and practically to bring the observer within sight of every section of land in the county.

Prominent points either of elevations or depression were visited and observations made upon them.

Many cross checks and other means of correction were applied to overcome errors in atmospheric pressure, instrumental irregularities, and errors of observations.

Finally the results thus obtained were expressed by contour lines on the maps with figures showing the elevations of the points taken in the several counties.

Great care was taken to make the data atlas map of the State more correct in its horizontal features than any heretofore published.

The locations of towns and courses of streams were in most cases either verified or corrected.

The time allowed for making the survey was one year, and the area covered was 56,000 square miles.

It is hoped that future observations will show that the work has been as well done as the limitations of time and funds would admit.

From the data thus compiled the committee proceeded with the work of having the relief map of the entire State made in plaster, that material being the best known for durability. Miss Louise Barwick of Tracy, Cook County, Illinois, a skilled artist in modeling work, was engaged to model the map in clay preparatory to making the plaster cast.

The work was executed in the following manner:

Six wooden squares 2 inches thick were made. These were of sufficient size that when joined together they made a surface larger than the map would occupy, and represented the sea level upon which the map was built up to the points of elevations taken in the survey.

The squares were then covered with cloth surfaced so as to retain the finest lines. By means of carbonized paper the contour lines and figures representing the elevations and depressions of the surface of the country in the data atlas, heretofore mentioned, were transferred

clearly to those squares. Slender wire nails were driven into the wood as a guide to the modeling. By measurements the portion projecting above the wood corresponded with the figure on the contour line where they were driven.

In making the survey of the State over 90,000 points of observation were noted, and the same number of nails had to be driven to form the lines for the modeler in the clay work, which it was necessary to execute first in order to cast from the clay moulds in which the finished plaster map of the work was made. Three months time was occupied in doing that part of the work.

The squares were placed on a platform in a horrizontal position carefully joined together, the whole representing the State on a surface 10 by 17 feet.

After the whole had been painted a light green in color, the county boundaries were shown by heavy red lines; the lakes, rivers and smaller streams in blue; the railroads by black lines, and the names of county seats in heavy black letters.

The whole, when completed, making a graphic birdseye view of the State, the like of which no human eye had ever seen before. As an exhibit it was one of the most interesting in the building. It was daily surrounded by the aged and the youthful visitor, who seemed greatly impressed as they gazed on the face of our great State. Teachers, students and children engaged in the primary grades of education, seemed alike deeply interested in studying it.

The plain around the entire map, as aforesaid, represented the sea level. The Mississippi river, as the western boundary, was shown slowly rising above that level from 268 feet low water mark at Cairo, until, at the northwest corner of the State, it has an elevation of 615 feet, and the waters of the Wabash river, on the east,

reach an elevation of 601 feet, while Lake Michigan, at Chicago, placidly rests at an elevation of 595 feet above the sea.

The lowest point of land in the State is at Cairo, and the highest is that of Charles mound, on the State line of Wisconsin, in JoDaviess county, which reaches the height of 1,257 feet above the sea.

It was a surprise to a great many visitors, even those who were old residents of the State, when looking at the map, to see a high range of hills crossing the southern portion of the State. The fact, as shown by the map, is, that a spur of the Ozark Mountains of Missouri extends through Union, Johnson, Pope and Hardin counties. The highest of these hills, and the highest point of land in Southern Illinois, is what is known as Bald Knob, in Union county, which has an elevation of 985 feet.

In Johnson county, the highest point of observation was 800 feet; in Pope, 823 feet; and in Hardin, 780 feet.

There are well founded reasons for believing that there has been a period in the past when this range of hills was much higher, and has been worn away by the influences of time, yet the range at the present time is nearly 200 feet higher than the waters of Lake Michigan at Chicago.

There is an erroneous belief existing among non-residents of the State, and many of its citizens who have not traversed it, that much of the surface is a level plain, which will not admit of sufficient drainage necessary to ensure the best agricultural results. The map dispels that idea at sight. In addition to the range of hills mentioned, it shows two other great water-sheds extending across the State from the northeast to the southwest, with elevations above the Mississippi, Wabash and Illinois rivers, varying in height from three to five hundred feet, and the remarkable fact that the interior

streams of the State flow north, south, east and west, with strong currents, into these outlets. It also shows that the State has within its borders the means of creating one of the greatest water powers in the world, with the great lakes as a reservoir to feed the same.

The bed of the Desplaines river at Joliet, forty miles from Chicago, is 46 feet lower than the waters of Lake Michigan. Only the outlet has to be made and powers for manufacturing purposes can be made far surpassing that of Niagara, because at Ottawa, eighty miles distant, the Illinois River is 146 feet below Lake Michigan, and this would permit the same power to be used many times.

The map shows, as cannot be shown on a flat map, many interesting features of the State, which in future years will without doubt add greatly to its prosperity and wealth, and which will enable it to maintain a dense population. As an evidence of the correctness of the survey of the surface of the State made for this purpose, and the perfection in modeling the form as it exists, the map on exhibition proved a great object lesson to the students of glacial geology.

In all such prehistoric investigations, where positive proof of theories are not in existence, the human mind has a wide range in conjecture, and no ideas of one investigator are free from attack by a conflicting mind.

As no other State in the Union had made a relief map in the form of this one from actual survey of its surface, students of national reputation, from different States, studied its markings with much care and interest. These markings represent the only data we have of prehistoric periods in the earth's history, in which students of glacial geology are much interested.

No one can give any definite information in reference to the lapse of time since the Glacial period, or how long

it continued, but this map shows clearly to the eye of a student that there has existed on the surface of the State of Illinois two distinct periods, and that a long interval of time intervened between them.

Subsequent to the coal era it appears that there was a period when nearly the entire State was covered with ice and water, a portion of the northwest corner and a part of Calhoun county being of such elevation that they were not covered. The Ozark Hills were the southern shore line, but when the Mississippi and Ohio rivers broke through these hills the State was drained and the waters receded to Lake Michigan.

The drifts of that era, no doubt, came from the north, and carried with them the specimens of copper and the dark granite boulders found as far south as the hills, from the Lake Superior regions, where the mines of the former and the parent rocks of the latter are now found.

The stratified formation of the soil in the southern part of the State indicates that the silts were deposited from water and not from ice, because deposits from the latter are hilly and irregular in outline. The last glacial period, when the great field of ice, over 250 miles wide, which brought with it the immense deluvian deposits that have made Illinois the rich agricultural State that it is at the present time, the map shows, came from a northeast direction, through Lake Michigan.

The central part of that flow entered the State at or near where Chicago is now situated, and moved in a southwesterly direction across the State by what is now known as the valley of the Illinois river.

A well defined line of deposits exists on each side, varying in depth from 100 to 200 feet, creating the water sheds before mentioned, sloping on either side towards the center and outside, and the whole decreasing in height as they approach the western side of the

State. These deposits are not in any regular outline like a range of hills or mountains, but dropped, as if it were by chance, where a great iceberg, loaded with a special freight, lodged and dissolved.

Great nests of boulders, gravel beds, ridges and mounds of heavy, reddish clay, and deep beds of blue clay, all are found distributed without order of arrangement. In them are found the gray granite boulder specimens of rock gravel and the clays which are now found in their natural order on the northern shore of Lake Huron and on the shores of Hudson Bay.

The deposits on the southern line of the drift are near the same depth as on the north line, but much wider and more evenly distributed on the surface.

The deposits on the north side are more irregular on the surface, with projecting points in a northwestern direction. If the reader who has not seen this map will examine the direction in which the numerous small streams flow, which have their source near the summit, on a flat map the lines of these elevations can be readily followed.

It will be noticed that the northern ridge is thrown out from Lake Michigan near Milwaukee, Wisconsin, Lake Geneva, source of Fox river, being the highest plateau, with an elevation of 900 feet, which is 300 feet above the water of Lake Michigan.

The highest point of the ridge enters Illinois in the northwest corner of McHenry county, with an elevation of 1,000 feet. Woodstock is the highest county seat in the State, being 916 feet.

Southward, in Kane county, Briar Hill is 973 feet. Further south, in the same county, Lilly Lake is 934. The line then bears westward into DeKalb county, where, on section 7, township 39, range 5, there is a point 940 feet. Still further west, in the same county, there is

another point on section 19, township 38, range 3, which is 970 feet.

Sycamore, the county-seat, being on the northwestern slope, is only 857 feet. Geneva, the county-seat of Kane county, on the southeastern slope is only 720 feet.

From the last point named in DeKalb county there is a spur extending northwest into Ogle county, a distance of twenty-five miles. Malta, on the line of the Chicago and Northwestern Railway, is 925 feet high, and Holcomb, on the Chicago, Burlington and Quincy Railway, 836 feet. The main line of the ridge continues westward through the southern part of Lee county. Paw Paw, in the southeast corner of the county, is 930 feet. Further west, West Brooklyn is 963 feet, and still further west Sublette, 934 feet. Continuing on in the same course, Ohio, in Bureau county, is 920 feet. From there the elevation descends towards the west until at Sheffield, the summit of the Hennepin canal survey, it is but 673 feet.

The summit of the southern line of elevation enters the State from Indiana in Vermilion county, on the line of the Lake Erie and Western Railway. The station at Cheneyville is 721 feet. Hoopeston, further west, 714 feet; Rankin, same line, 715 feet.

Paxton, county-seat of Ford county, is 790 feet. Melvin, on Illinois Central Railway, northwest from Paxton, is 808 feet. West, in McLean county, on section 4, township 23, range 6, the elevation is 913 feet, which is the highest point in the central part of the State. Arrowsmith 876 feet, and Bloomington 821 feet. From there the descent towards the southwest is gradual. Springfield is 602 feet. As heretofore mentioned, the deposits were much greater in area and composed more of clays toward the south.

The table lands of Vermilion, Champaign, Piatt and Macon counties were thus built up.

The southern line where the deposits cease is through Clark, Cumberland, Shelby and Christian counties.

Another attractive feature of the State is the demonstrated fact that the territory covered by the deposits south and east of the Illinois river, comprise the great corn belt of the State, and south of that the fruit country. The composition of the soil is lighter, warmer and so different in color as to be noticeable at sight.

Northward the numerous streams, springs and lakes of pure water, the hills and valleys producing the best grains and grasses for the purpose, is the great dairy region of the State.

The map points out other great changes that have taken place in the geography of the territory now occupied by the State and by it the fact has first been discovered. Looking at the north end we see Rock river coming down from Wisconsin through a broad valley until it reaches a point, a few miles south of Rockford, where it has an elevation of 680 feet.

The map shows that there was a time when it continued in its southern course through the Kite Creek bottoms and Inlet Swamp and then southwest by what is now Green river.

When the drift came as mentioned extending northwest into Ogle county a dam 156 feet high was built across the channel which caused the accumulated water to break through the hills in a southwest direction where it now flows through a narrow channel where the rocky bluffs are rugged and do not present the time-worn appearance of those north of Rockford. The difference is strongly marked to the observer. On the west side of the State we find the evidence of another great change. When the Mississippi river passes the high rocky bluffs at Fulton, the bluffs on the Illinois side disappear and the flat country known as the Cattail

Swamps and Meredosia Flats commences, which further south extends across to Rock river. When both streams are at high water these flats are submerged.

The Mississippi at that point at low water has an elevation of 564 feet and the Illinois river southeast, at Hennepin, Putman County, at low water is only 441 feet.

The evidence is very strong that the course of the Mississippi River formerly was in a southeast direction from above Rock Island, entering the Illinois river at or near Hennepin, and what is now called the Illinois river valley was at a former period the course of the Mississippi river.

Here again the drift at Sheffield, Bureau county, where there is a deposit mostly sand over 150 feet deep, created a dam higher than the rocks at Rock Island. That obstruction was more than sufficient to force the waters of the Mississippi to seek an outlet over the rocks at Rock Island. It had then to flow nearly in a western direction until it reached Muscatine, where it found its first opportunity to return to its southern course.

It will be noticed that the survey of the proposed Hennepin Canal descends from Sheffield to Hennepin 232 feet, and from the same point to the Mississippi only 109 feet, and that a ditch cut through the summit at Sheffield 130 feet deep would bring the waters of both the Mississippi and Rock river into the Illinois river with a rapid current.

The evidence mentioned in reference to the change in Rock river is again to be seen in the bluffs of the upper Mississippi and Illinois rivers when compared with those on the present course of the Mississippi from Rock Island to where it rounds the point of Calhoun county into its original channel.

The map shows those outlines very plainly, and other points displayed by it will forever in part remain a

mystery which will draw upon the imagination of the human mind for an explanation.

We see the facts as presented to us, and the concentration of human thought for ages is not likely to devise any other theory by which the changes could have been produced by the forces of nature.

We find in these deposits spoken of small hills of gravel mixed with larger stones, worn smooth by friction against each other in water, deposits of unmixed clays without any other like them for miles away. We find in different localities great nests of boulders on a small area rounded and flattened in varied forms, and no parent rocks like them within hundreds of miles.

It seems impossible to even think of any other way of transporting them than by the theory of the present age.

The reader may ask how the map shows the difference in time of those glacial periods.

Because that portion of the State not covered by the second drift shows a much more uneven surface.

The water courses large and small have wider and deeper valleys. The bluffs along them show long exposure to the wear of atmospheric influence on their form, while on the portion covered by the second the valleys of the stream are of less depth and narrow, and the bluffs more abrupt and broken in form, and do not show so long exposure to the wear of time.

The difference between the appearance of the two on the map is so plain as to be noticed at a glance by one interested in that study.

The map teaches many more object lessons to the student of geography of our State, and if one could be placed in every school of the State the value to the cause of education in that one study cannot be estimated.

According to the requirements of the joint resolution of the last General Assembly, the Relief Map and the data from which it was made were sent, after the close of the Exposition, to the Museum at Springfield, where it will continue to be an interesting study, as it was at the World's Fair.

### Wall Maps.

In compliance with the law, the Commission directed the committee to have Rand, McNally & Co., of Chicago, prepare a series of large maps of the State, compiled and engraved expressly for exhibition at the Fair.

*First.* A sectional map, the scale of which was fixed at four miles to the inch, one section of land thus being one-fourth of an inch square, a scale sufficiently large to locate a quarter section of land, the whole covering wall space  $5\frac{1}{2} \times 9$  feet.

For the survey of the State the records of the United States land office were used, and for details of topography advance sheets of the "United States Geological Survey" were procured.

For the location of post offices, cities, towns and villages, the records and maps of the post office department at Washington were used.

For the location of the Mississippi river the large scale maps of the Mississippi River Commission were used, and the Geodetic and "Coast Survey" maps were used for determining the shore of Lake Michigan.

For locating the lines of railroads within the State, without an exception, the profile of each separate corporation was procured from the Chief Engineer's office of the company, all lines being correctly traced through each section of land.

The above authentic information was put in the hands of the best draughtsmen that could be obtained, and the map thus made was an entirely new one. After the draw-

ing was completed it was engraved by the relief line engraving process, and the sheets were printed from electrotype plates. The subsequent coloring was all done by hand.

*Second.* Besides the foregoing, a geological map of the State was prepared, the records of the State Geologist supplying the necessary data, and the various formations being carefully colored in accordance with recognized surveys.

*Third.* A special map was also furnished, based upon reliable information, showing the general effects of glacial action throughout the State, as well as the character of the soil. This map was prepared on separate sheets and colored by hand.

*Fourth.* A map of special value from an educational point of view was designed to show, by red crosses, the location of each and every schoolhouse in the State supported by public funds—7,000 in all.

*Fifth.* Finally a map was prepared showing the location of every public building in the State, the name of the institution being plainly written thereon.

These maps were all of the same size and, being on so large a scale, made an attractive exhibit.

They conveyed to the mind of the visitor a lasting impression of the superficial area of our State, its geological wealth, its glacial history, its educational progress and the distribution of its public buildings.

Copies of each of these maps were, at the close of the Exposition, sent to Springfield.

The foregoing comprises the work assigned to the committee, and this report is respectfully submitted.

SAMUEL DYSART,  
E. C. PACE,  
W. D. STRYKER,  
B. F. WYMAN,  
E. E. CHESTER.

*Committee.*

## REPORT OF THE COMMITTEE ON NATURAL HISTORY AND ARCHÆOLOGY.

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**I**N accordance with the requirements of this Board, and in pursuance of the act of the Illinois Legislature creating it, your committee on Natural History and Archæology begs to submit the following report:

Soon after the organization of the Board of World's Fair Commissioners assignments were made by order of said Board to the different interests to be considered, and among said assignments a committee, designated as the Committee on Natural History and Archæology, was created, consisting of the following named members of said Commission: E. C. Pace, A. B. Hostetter, William Stewart, B. Pullen and W. D. Stryker.

The scope of their duties comprised, as the name indicates, everything on and under the surface of the earth produced by natural causes, also embracing some features of artificial production. Exigencies arising and interests worthy of attention being from time to time brought to the attention of the Commission, several of them were assigned to this committee, thus constituting probably the most extensive and varied department in the entire exhibit. Taking them in their regular order they stand as follows:

*First.* The Laboratory of Natural History.

*Second.* The Fish Exhibit.

*Third.* The Forestry Exhibit.

*Fourth.* Geology.

*Fifth.* Archæology.

*Sixth.* Glacial Geology.

*Seventh.* The Clay Exhibit.

The law constituting the Commission also directed the heads of the different departments of the State Government to render all assistance that might be required of them by the Commission, and also permitted the use of any material belonging to the State to be used for supplementing or completing exhibits in the different, or in certain departments. This was exceedingly favorable to your committee, as it provided not only a considerable amount of material, but furnished competent persons to take charge of and prosecute the work to a successful completion, so that in the purely scientific departments we had the able services of the following well known scientists:

Prof. S. A. Forbes, of the University of Illinois, in the Laboratory of Natural History.

Piscatorial Exhibit, Col. S. P. Bartlett, of the State Fish Commission.

And in the Department of Geology was Dr. Josua Lindahl, Curator of the Museum of Natural History, at Springfield, connected with whom were such distinguished scientists as Prof. J. A. Udden, of Rock Island; Prof. Milton Whitney, of John Hopkins University, Baltimore, Md.; Prof. Frank Leverett, of the United States Geological Survey, and Prof. J. M. Nickles, of Sparta, Illinois, besides the office force at Springfield.

The Department of Forestry, not having a departmental head as an appendage to the State government, was placed in the hands of Hon. Martin Conrad, of Chicago, a gentleman thoroughly acquainted with the forestry of the State and fully alive to its interests.

The Department of Archæology was presided over by Prof. William McAdams, of Alton, Illinois, a man who has written as much and developed more in this line than probably any other person in the United States. He has spent a lifetime in this work, and the books he

has written and the collections he has made will live as monuments long after his sturdy form has crumbled to dust.

The collection of glacial float, which is here referred to as Glacial Geology, was collected and exhibited by Mr. Ossian Guthrie, of Chicago, and whatever of merit or interest it may have possessed, to him is due the entire credit.

The Clay Exhibit was made under the direction of Mr. D. O. Loy, of Ashkum, Illinois, a practical clay worker. It was made at a comparatively trifling expense to the State, and in point of beauty of design, quality of work, and variety, probably excelled anything of the kind in the entire Exposition.

The entire department was thronged with visitors from the day it was opened, on May 1st, until its close, on the 30th day of October.

Probably the most attractive feature of the exhibit was the piscatorial. Every foot of available space around the pool, or "the rustic bridge that spanned the babbling brook," was constantly crowded with people anxious to get a look at the finny inhabitants of the clear, sparkling pools. This exhibit was no more entitled to attention than others, but as a prominent scientist remarked, "live things catch the eye." Feeling that a short, hurriedly written report from the different departments would not do justice to this exhibit, your committee has given considerable latitude to the Superintendents, so as to enable them to present reports worthy of the occasion. Particularly is this the case in the department of Archæology. Nature has filled our forests with magnificent spires, and carpeted her lawns with her own made carpets. The lakes and rills have furnished an abode in which the fish may live and multiply—even the depths of the earth have furnished evidences of its age and creation—but the towering pyramids of earth and

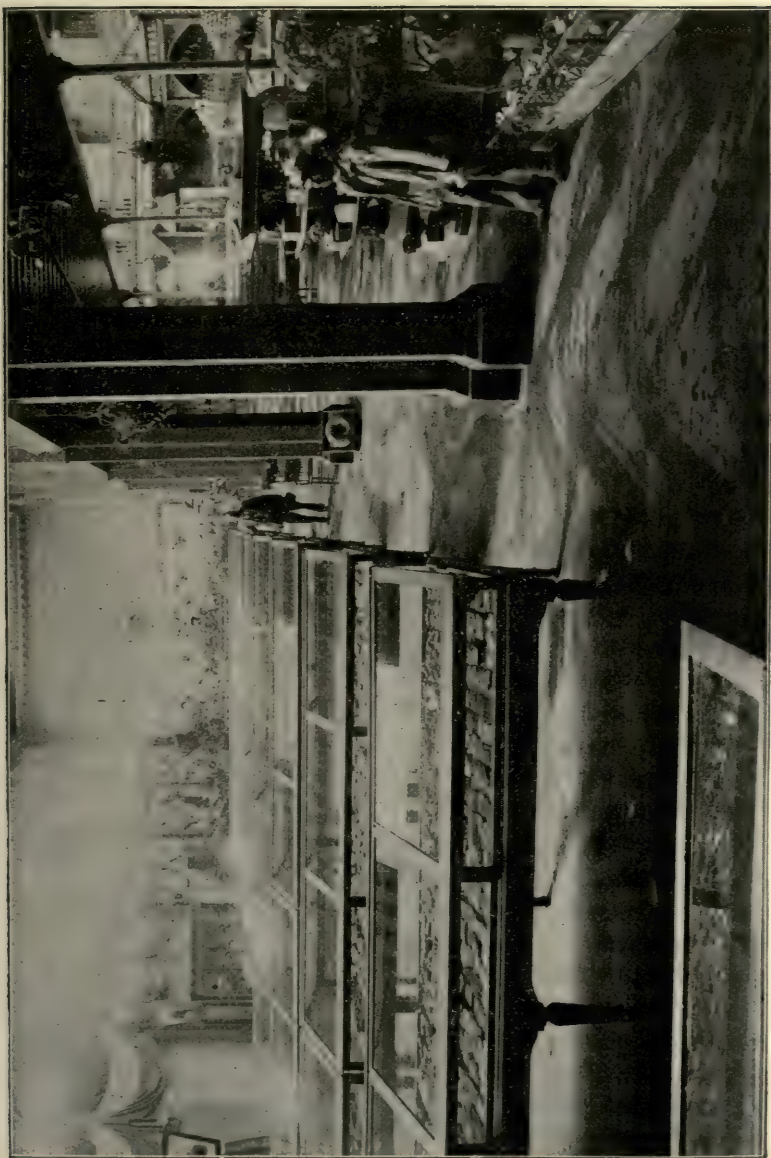
the relics of war and agriculture, are the mute and only records left to tell the sad story of a wonderful, intelligent and numerous people.

This department is, to a certain degree, allegorical, to some extent legendary, and largely speculative. The very mystery that surrounds it clothes it with an interest that transcends that which we are able to comprehend. We reason, ordinarily, from cause to effect, but in this it is reversed,—we reason from effect back to cause,—and when we stand in the shadow of the magnificent temples and pyramids built by this unknown and extinct race of people, we may justly ask ourselves if they had not attained the same degree of intelligence and art as that attained by the ancient Egyptian when he laid the foundation of the pyramids that are now the wonder and admiration of the world.

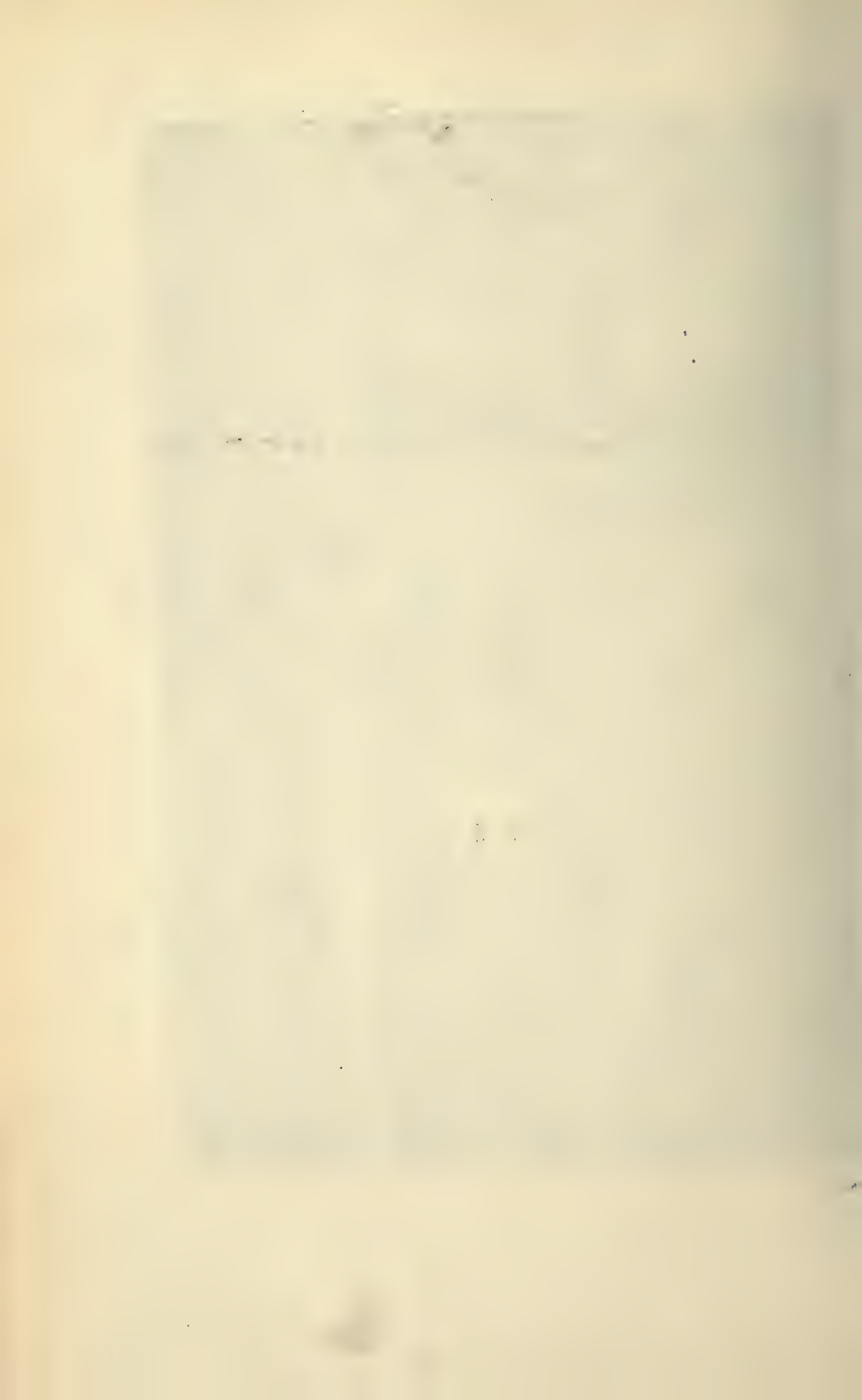
And now, Mr. President and gentlemen of the Commission, we desire to submit this and the reports of the different departments of our exhibit, as the report of the Committee on Natural History and Archæology.

All of which is respectfully submitted.

E. C. PACE,  
A. B. HOSTETTER,  
WM. STEWART,  
B. PULLEN,  
J. D. STRYKER.



DEPARTMENT OF GEOLOGY.



## GEOLOGICAL REPORT.

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BY PROF. J. LINDAHL.

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**I**N compliance with a request from the Hon. Ed. C. Pace, chairman of your committee on science, I beg hereby to submit to you a brief report on the geological work done under the auspices of the said committee, together with more elaborate special reports from Mr. Frank Leverett, Prof. Milton Whitney and Prof. J. A. Udden.

According to my original plan, as laid before the Illinois State Board of Agriculture, early in 1891, the geological exhibits from this State were to present mainly:

1. *An economical series*, showing the natural resources of the State, in soils, waters, coals, clays, building stones, metallic ores, and other mineral products utilized in the arts and industries; all of them, as far as practicable, to be submitted to scientific tests, in order to ascertain their chemical and physical properties, and the results of such tests to be stated on the labels, as well as in an eventual catalogue.

2. *A stratigraphical series*, representing as nearly as possible the entire succession of strata in the earth's crust within the State, as exposed in natural outcrops or artificial sections in railroad cuts, quarries, and mines; and,

3. *A paleontological series*, comprising a fairly complete collection of all the fossil species of animals and plants, known to occur within the State.

This plan was subsequently so far modified by you that no expenses would be allowed for the purpose of collecting and testing the materials of the "economical series,"

with the exception of the soils. As a necessary consequence, this division of the exhibition gave no approximate conception of the natural resources of the State, a fact so much more to be regretted, as the State of Illinois produces nearly one-fourth of all the limestone quarried in the United States for building purposes, and also nearly one-fourth of all the coal mined in the United States, outside of Pennsylvania.

The only systematic exhibit in the economical division was that of the agricultural soils. Much work of high scientific value had been accomplished within the previous years by the United States Geological Survey, in regard to the superficial deposits of Illinois. The work had been done under the direction of Prof. T. C. Chamberlin, as chief of the glacial division of the geological survey, mainly by Mr. Frank Leverett, assistant geologist. Prof. Chamberlin cheerfully consented to my request that Mr. Leverett be allowed to accept a temporary engagement in the service of the Illinois State Survey during a few months in 1892, for the purpose of preparing a map of the glacial deposits and agricultural soils in Illinois, together with an extensive collection of these materials, and that, in doing this, he be permitted to make free use of all the (thus far mostly unpublished) results of the previous work done by Prof. Chamberlin and assistants, as far as such work would have any bearing on the subject in view.

Mr. Leverett was thus employed at your expense, and his map and collections of samples of soils, as displayed at the World's Fair, formed a most interesting and highly appreciated feature of the geological exhibits in the Illinois Building. He also prepared a report on his work, which you will find hereafter.

A suitable selection of samples of these soils was sent to Prof. Milton Whitney, of Johns Hopkins University, Baltimore, Md., (now Chief of the Division of Agriculture,

Soils Division, United States Department of Agriculture, Washington, D. C.). Prof. Whitney kindly consented to my application, that he would submit these samples to mechanical analysis, and prepare a report thereon for publication in an eventual descriptive catalogue of the exhibits. As, however, the analysis would consume more time than Prof. Whitney could devote to the work, he asked that a laboratory assistant be furnished him at your expense. Prof. J. A. Udden, who had just then completed the work entrusted to him, as will be mentioned hereafter, agreed to act as such assistant, and he at once proceeded to Baltimore. Prof. Whitney's report will be found hereafter.

Outside of the soil exhibit, which was thus accomplished at your expense, the division of economical geology was almost exclusively made up by voluntary contributions from owners of mines and quarries, brick kilns and terracotta works, etc. Invitations to participate in the exhibition had been sent out to fully two thousand parties, including 918 coal mine owners, but extremely few responded.

Among exhibits in this division may be mentioned three that were of special interest, viz.: (1) the fluorspar from Rosiclare, Hardin county, the only mines of their kind on this continent; (2) a large series of lithographic stones from Thebes, Alexander county, the only exhibit of its kind in the whole World's Fair, with the exception of one solitary slab in the Canadian department of the mining building; and (3) some pretty dishes of white and decorated *faience*, made of clay and silica, from Union county—the only article of white table-ware ever made out of purely Illinois materials. As these materials were the only substances analyzed at your expense, I give the results of the analyses.

*Ball Clay* from Mrs. M. A. Kellner's clay pit, Mountain Glen, Union county, Ill., (No. 3,011 Ill. State Mus. Cat.).  
Analysis by Knut Almstrom:

Silicic acid .....	51.71%
Titanic acid.....	trace
Alumina .....	32.75
Oxide of iron.....	1.93
Lime .. .....	0.53
Magnesia.....	0.19
Potash .....	0.96
Soda.....	.24
Water and organic matter.....	11.69
Total.....	100.00

*Earthy Silica* from the mine of the Chicago Floated Silica Co., Union county, Ill. (No. 3,009 Ill. State Mus. Cat.). Analyzed by Harald Almstrom.

Silicic acid.....	97.82%
Alumina and oxide of iron.....	1.08
Lime .....	0.50
Water and organic matter.....	0.42
Alkalies and loss.....	0.18
Total.....	100.00

The very handsome dishes were manufactured under the direction of my esteemed friend, the Hon. Robert Almstrom, director of the Rorstrand Porcelain Works at Stockholm, Sweden, and I beg to use this opportunity of officially thanking him for his courtesy and painstaking labors, by which he has established as a fact the long-doubted possibility of making white earthenware from purely native Illinois materials.

The *Stratigraphical Division* consisted mainly of four diagrams, representing sections across different portions of the State, and accompanied with four sets of samples of the strata out-cropping along the lines of these sections. These sections were as follows:

1. *The Mississippi River Section.* This section was constructed by using a profile of the bluffs from the north-western corner of the State clear down to Cairo, which profile was furnished by Prof. C. W. Rolfe, of the University of Illinois. The stratification was indicated mainly in accordance with the "Mississippi River Section," in Vol. I., Geol. Surv. Ill., with such local corrections as were possible from data furnished by Profs. J. A. Udden for Rock Island county, and J. M. Nickles for the southern counties. Rock specimens, to illustrate this section, were selected out of the collections in the State museum in Springfield.

2. *The Rock Island, LaSalle, Indiana State Line Section.* This was constructed by Prof. J. A. Udden, of Augustana College, Rock Island, who was employed to survey the line during the summer of 1892, at the same time collecting a complete set of samples from out-cropping strata, which samples were displayed at the Fair, along with the section. Prof. Udden has furnished a report on his work, which you will find hereafter.

3. A section along a line from East St. Louis, on the Mississippi, to Shawneetown, on the Ohio, passing through the greater part of the coal measure series; and,

4. A section along a line through Waterloo, Sparta, Murphysboro and Olmstead, thus crossing the Ozark highland, with its conglomerate beds, and the tertiary deposits in the extreme south of the State. These two sections (3 and 4) were constructed by Prof. J. M. Nickles, of Sparta, from surveys made by him during the summer of 1892 and in the early spring of 1893. He also collected samples of all the strata exposed along the said lines.

To the stratigraphical division belonged also two sets of diamond drill cores, arranged in vertical cases, with grooves for the retention of the core in proper order, and glass fronts. One of these sets contained all the

core that had been preserved from a boring at Braidwood, Will county, to a depth of 900 feet; it occupied thirteen cases, five feet high, each with eight grooves. The other set contained one sample of core, one to four inches long, from each stratum penetrated in a boring at Harvel, Montgomery county, to the depth of 775 feet. Each set was accompanied with a diagramatic boring log.

In this division may also be counted the large geological map which was placed on the south wall. It was based on the map issued in 1876 by the Geological Survey of Illinois, as an appendix to volume VI. of the reports; corrections were made, as far as possible, from data in notes accumulated by myself in previous years, and by Profs. Udden, Nickles and Nicholson, in the course of their respective work in connection with the World's Fair preparations. The tract of the great upheaval in Calhoun county had been surveyed in the summer of 1891, by Dr. N. O. Holst, State Geologist, of Sweden, accompanied by Prof. Udden and myself. The color schedule adopted for this map, as well as for the above four sections, was in close accordance with the suggestions made by the director of the United States Geological Survey, Major J. W. Powell, in his tenth annual report.

*The Paleontological Division* consisted of an extensive collection of fossils, selected from the Illinois State Museum and supplemented with specimens from the private collection of the former State Geologist, the late Prof. A. H. Worthen, which collection you had purchased for this purpose on my suggestion. That entire collection was afterwards, as I understand, donated by the State to the University of Illinois, at Champaign. Some other specimens had been borrowed from private parties, as, for instance, the large trunks of ulodendron, etc., which were the property of Mr. P. A. Armstrong, of Morris, Ill.

The specimens exhibited represented with fair completeness all the species of fossils recorded as having been found within the boundaries of this State, together with some such species as, from their occurrence in adjacent States, may be expected to occur also in Illinois.

The great scientific importance of this collection, as well as its value in exhibiting to the world what the State of Illinois had done in this branch of science, may be realized from the fact that it contained, among other things, more than 1,000 "types" of new species of fossils, which were first made known to the world by the descriptions and figures of those very specimens, published in the eight volumes of reports of the Geological Survey of Illinois.

The collection was arranged systematically, according to zoölogical and botanical classification. In order to facilitate the study of the fauna or flora of any particular geological age, there was stuck on, in the center of each label, a small, circular tag, bearing the same color pattern as the corresponding geological terrane on the map and sections above referred to, which was placed close to the paleontological show cases. Wherever it is impossible to display, in a geological museum, two parallel series of fossils—one arranged biologically, one stratigraphically—I believe the above arrangement, including the advantages of both, to be far preferable to a single series arranged according to geological succession in time.

The abundant paleontological material at my disposal from the two collections, viz.: the State Museum and Prof. Worthen's private collection, was rather embarrassing, as neither of them had been more than partially classified, and that so long ago, that, considering the rapid progress of paleontological science in the last decades, a thorough revision was necessary. The specimens

were, therefore, first assorted and classified in a preliminary way, and each class of fossils was subsequently submitted to critical examination by an eminent specialist. The corals were thus revised by Dr. Carl Rominer, of Ann Arbor, Michigan; the crinoids by Mr. Charles Wachsmuth, of Burlington, Iowa; the brachiopod by Prof. James Hall, the veteran State geologist of New York; the mollusks by Mr. E. O. Ulrich, of Newport, Kentucky; the trilobites by Prof. J. M. Clarke, of the New York State Museum, Albany, N. Y.; other crustaceæ by Prof. Charles E. Beecher, of Yale Museum, New Haven, Conn.; and all the coal measure plants by Mr. David White, of the U. S. Geological Survey, Washington, D. C. Valuable aid was also rendered, in several instances, by Prof. E. D. Cope, of Philadelphia, and Dr. C. H. A. White, of the U. S. National Museum.

Nearly all of the above gentlemen, besides carefully revising the old labels and determining numerous specimens hitherto undetermined, also presented brief reports on the collections examined by them, mainly discussing the geological and geographical distribution, within the State, of the several species or genera contained in the said collection. These reports were written, at my request, for the purpose of being inserted in an eventual descriptive catalogue of the exhibits, and they were turned over to you for such purpose on the day of my resignation. It appears that, in the confusion unavoidably accompanying the closing days of the exhibition, all these papers were lost.

The State rests under deep obligation to the above distinguished paleontologists, who so cheerfully gave their time and knowledge to a work from which they derived no personal benefit, while it reflected great honor on the State, and will prove a permanent benefit to all who will study these collections in the State Museum or at the State University.

During two years from July, 1891, to July, 1893, I was most ably assisted by Prof. Wm. F. Nicholson, who, on your authorization, was appointed my assistant in any or all of the work incumbent on me as curator of the State Museum, or as director of the geological work for the State for the Columbian Exposition. He filled his position with skill.

Miss Fannie Fisher, who held the position of secretary at the State Museum until her resignation from that office in July, 1893, rendered excellent service as clerical assistant.

The extreme delay in completing the installment of exhibits, and particularly in preparing new labels and substituting them for the old ones, was due mainly to the entire lack of adequate office accommodation for the geological department in the Illinois State Building.

Yours respectfully,

JOSUA LINDAHL.

AUGUSTANA COLLEGE,  
ROCK ISLAND, ILL.,  
May 9, 1894.





GLACIAL AND SOIL MAP OF ILLINOIS.



## SOILS OF ILLINOIS.

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BY FRANK LEVERETT, ASSISTANT U. S. GEOLOGIST.

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### *Explanation of the Map.*

THE morainic belts mark margins of the ice-sheet at points where the onward flow and the wastage were nearly balanced for a considerable period of time. The drift in these belts is massed into ridges and knolls, while between them the surface is usually very level. The principal morainic ridges rise 50 to 75 feet, and occasionally 100 feet, above the bordering plains. Some moraines (especially those near Fox river in the northern portion of the State) are made up of a great many small knolls and ridges inclosing basins and small lakes. Other moraines (especially those in the central and eastern portion of the State) consist of a single great ridge, seldom less than a mile, and in some instances several miles, in breadth, whose surface is but gently undulating.

In the older drift area there are very few knolls and ridges. Such as occur usually contain much gravel and sand, but in some instances a stony clay constitutes the bulk of the ridge or knoll. A belt of these ridges and knolls follows the west side of the Kaskaskia river, and marks the division line between the white clay soils and the black soil of pervious silt. Why it does so is not as yet known, nor is the origin of these ridges clearly understood. They seem to be a joint product of the ice-sheet and its associated streams of water.

The portion of the older drift in northern Illinois, which has no silt covering, is, in part, lower than the districts bordering it, which are covered with the silt.

The silt depositing waters seem to have been excluded from this district because the ice-sheet still covered it while these waters were at their highest stage. This appears to be the newest portion of the older drift.

The several classes of silts found on the surface of the older drift are so fully discussed in the text, that further explanation seems unnecessary, except perhaps the statement that, where heavily shaded, the silt is thicker than where lightly shaded.

The sandy districts are characterized by ridges and knolls, drifted (in part, at least,) by the action of the wind. An attempt is made to represent this aggregation by unequal shading of the district thus covered.

The glacial grooves indicate the direction of the ice movement. They are usually nearly at right angles with the trend of the adjoining morainic belt, or if on the older drift, they are directed towards the margin of the ice-sheet which deposited that drift.

The old outlet of Lake Michigan, down the DesPlaines and Illinois, and the width of the channel, is represented in blank, as is also the portion of Cook county covered by the old lake.

Natural gas has been obtained from the drift in sufficient amount for use, as fuel, in a few dwellings in several different localities in the State, the principal districts being in Bureau, LaSalle, Livingston and DeWitt counties. Being from this source, they are necessarily of low pressure and small volume. The gas accumulates in sand beds between beds of clay, and is derived either from the vegetable material in buried soils in the drift, or from passage upward from the shales underlying the drift.

Flowing wells are often obtained from the drift on the plains bordering the morainic ridges. The principal district is in Iroquois and Ford counties, where several hundred wells have been obtained without entering the rock. In this district, the water supply is apparently

from the elevated ridges on the south, and not, as popularly supposed, from the Kankakee marsh on the north.

For convenience of reference, we have condensed into the form of a tabular statement the origin or mode of deposition, and the areal distribution of the several classes of soil. The accompanying map will aid in understanding the distribution.

**Table of Soils of Illinois.**

VARIETY.	ORIGIN OR MODE OF DE- POSITION.	AREAL DISTRIBUTION.
Residuary.	Decay of the underlying rocks.	Driftless portion of the State where- ever the loess as well as the glacial drift is absent.
Glacial clay.	Glacial.	Mainly in the northeastern quarter of the State, where loess and silts are generally absent. The Shelby- ville moraine forms the southern boundary, and chiefly the western boundary, but in northern Illinois glacial clays form the soil on the older drift area between the Shel- byville moraine and the loess of the Mississippi Valley.
Gravelly.	Glacial over- wash. Streams, Lakes.	With the glacial clay in the north- eastern part of the State, and along streams leading away from the Shelbyville and later moraines. This variety of soil includes gravel knolls and ridges, overwash gravel plains, terraces and raised beaches.

Table of Soils of Illinois—Continued.

VARIETY.	ORIGIN OR MODE OF DE- POSITION.	AREAL DISTRIBUTION.
Sandy.	Glacial drain- age. Streams, Lakes, Winds.	Mainly in basins along the Kanka- kee, Green and lower Illinois rivers; old lake bottom and raised beaches near Chicago; also on bot- tom lands, and fringing in many places the low bluffs of streams, and locally developed on areas of glacial formations.
Silts pervious to water (chief- ly the typical loess).	Mainly by slowly flow- ing waters; perhaps, in part, wind.	Along the Mississippi, lower Illinois, lower Wabash and lower Ohio rivers; also between the Illinois and the Mississippi from the Green river basin south to the latitude of Peoria, and in the basin of the Big Bureau Creek, in Bureau county.
Silts slowly pervious to water.	Mainly by slowly flow- ing waters; perhaps, in part, wind.	Mainly in West Central Illinois, west of a line connecting Alton, Litchfield, Pana, Decatur and Peoria; also on the eastern border of the Mississippi Valley loess belt, in the northern part of the State.
Silts nearly impervious to water. (Two kinds, name- ly white clays and gumbo.)	Nearly still waters; per- haps wind in part.	White clays cover much of southern Illinois south of Shelbyville mo- raine, as far west as the Mississippi loess, east to the Wabash loess and south to the Ohio river loess. Gumbo is found on some bottom lands along the main rivers.
Peaty and marly.	Vegetal ac- cumulations, and shell de- posits.	Locally over the greater part of the State wherever drainage is imper- fect. Peat is rare south of the lati- tude of Springfield, but it abounds in the northeastern quarter of the State, in bogs. Marl deposits are less extensive than peat, but are fully as widespread.

### 1. Sources of Soil Material.

The principal sources from which the soils of the State are derived are the glacial drift and the loess, with its associated silts of glacial age. The underlying rocks are indirectly a source of much material since their decomposed surface portions were incorporated in the drift, but they constitute a minor source, so far as direct contribution is concerned. Lakes and streams attending the melting of the ice sheet have contributed material in considerable amount, and it is thought that the wind, also, has been influential in distributing fine material over portions of the surface of the State. The present streams are also a source for soils in the districts over which they spread in their flood stages.

We may, perhaps, better appreciate the sources of the soils and the cause for their variation by a brief review of the recent geological events.

It is now well known, by the presence of glacial striæ and a deposit of glacial drift, that at one time a sheet of ice covered the entire State, excepting a few counties in the southern end; portions of Jo Daviess, Carroll and Stephenson counties, in the northwest corner, and a narrow belt in Calhoun and Pike counties, in the western portion of the State. (See Glacial and Soil Map.) When the ice sheet withdrew (because of the excess of wastage over onward flow), the stony clays and other material which it had deposited became weathered at surface into soil. Organic matter was added by life which flourished upon this soil, and in flat tracts it became blackened by humus to an average depth of several inches.

After a long period, apparently several thousand years, this soil became extensively covered by silt deposits, known as the loess and white clay, yet it may still be seen beneath these deposits, its dark color being in striking contrast with the light-colored silt. These silts now form

the surface over much of western and southern Illinois. A few counties in the northern part of the State are partially covered by them. To what extent the central and northeastern portions of the State became silt-covered is unknown, since, as shown below, these portions of the State were subsequently covered by a thick sheet of glacial drift. The loess and associated silts also cover nearly the whole of the *unglaciaded* portion of southern Illinois; the unglaciaded districts bordering the Mississippi in northwestern Illinois, and the entire unglaciaded district in Pike and Calhoun counties in western Illinois. Since the silt deposits are usually so thick that the soils are derived from them, and not from the underlying rocks, the portion of the State where the soil is derived directly from the underlying rocks is of much less extent than the unglaciaded districts. It embraces only portions of the elevated ridge traversing Union, Johnson and Pope counties, in southern Illinois, and portions of Jo Daviess, Stephenson and Carroll counties, in northwestern Illinois (to which should, of course, be added hillside exposures or other points within the glaciaded district, where rock comes to the surface.)

It is generally thought that the deposits of loess and silt were made by water, though some geologists are inclined to attribute their wide distribution over the uplands, between streams, to the supplementary agency of wind. That water had a great share in the deposition seems probable, from the fact that the deposits are much thicker along the principal waterways, such as the Wabash, Illinois and Mississippi, than they are in the districts remote from the streams. There is also a change from a porous to a very compact, nearly impervious, material in passing away from the streams, such as would be expected on the aqueous theory, the finer material having been removed along the current and retained in

the slack water of the border districts. The analyses of Illinois soils, made by Prof. J. A. Udden, under the direction of Prof. Milton Whitney, show that the loess, or pervious silt, contains no coarser particles than are found in the impervious silt, but that it is less heavily charged with very fine particles. It can scarcely be doubted that the removal of the fine particles is due to a current which followed the present main waterways. We would remark here that these analyses bring out the further important fact that the physical condition of *porosity* is a very important factor in determining fertility. Prof. Whitney has found this a principle of wide application in districts which vary greatly in the chemical or mineralogical constitution of the soils. The loess deposits along the Illinois and Mississippi rivers show considerable variation in thickness, the range being from about 20 feet up to fully 100 feet. On the Wabash they are somewhat thinner, being usually but 15 to 20 feet, and in some places much less. Within five or ten miles back from the stream the thickness of the loess decreases as a rule to but 8 or 10 feet, and seldom is greater than 15 feet. In southern Illinois, where this deposit is called a white clay, its thickness is only from 3 to 6 feet.

Subsequent to the deposition of the loess and associated silts the ice sheet again invaded Illinois, but fell short by over 100 miles of reaching as far south as in the earlier invasion. The limit of this later invasion is marked by the Shelbyville moraine, shown on the soil map. The amount of drift deposited is much greater than that during the first invasion, the thickness at the border of the later drift area being 100 to 150 feet or more, while in the earlier drift it seldom exceeds 40 feet, and is usually but 15 to 20 feet. The rise to this later drift sheet, in passing north or east from the earlier drift area, is well shown on the topographic map of the State, prepared by Prof. Rolfe.

Along some of the valleys which lead away from this newer drift district there are terraces of coarse gravel and cobble which bear clear evidence that they were formed by streams whose sources were in the ice-sheet. These deposits were apparently made in the *bed* of the glacial stream. At higher levels along the bluffs of these valleys sandy deposits occur, which are thought to mark the *flood plain*. In some instances the sand appears to have been drifted by wind to higher altitudes than were reached by the water. Such sandy deposits are to be seen along the valleys of the following rivers: Kishwaukee, Green, Illinois, Sangamon, and Embarras.

In its retreat this later ice-sheet had periods of halting (because of a balance between wastage and onflow). These were in several instances sufficiently long to build up prominent ridges of drift (moraines). Because of this method of formation, one passes into newer and newer country in crossing these ridges from southwest to northeast, the newest glacial ridge in the State being along the shore of Lake Michigan, north of Chicago. It should, perhaps, be stated that the ice-sheet apparently made some important readvances after beginning a general retreat, for its morainic ridges are far from concentric, and indicate that shiftings in the movement and great differences in the outline of the ice-sheet had occurred.

During this retreat, and for a period after the ice had retreated sufficiently for the development of drainage systems to begin, considerable portions of the newer drift area were apparently occupied by water, either as lakes or as sluggish streams. Deposits bearing evidence of the presence of water are found in the Kankakee basin, where a belt of sand several miles in width occurs along the entire length of the river. There are also notable accumulations of sand along the Illinois-

Vermilion, extending back several miles from the bluffs of the stream.

Much of this newer drift is covered by a thin sheet of loess-like, pebbleless, silty material. It is not nearly so thick nor so continuous a deposit as that covering the earlier drift. Where it is thickest, and most closely resembles the loess (in Bureau creek drainage area, north of the bend of the Illinois), it attains a depth of about eight feet. It is also notably present in central Illinois, from Peoria southeastward to Bloomington, covering not only plain tracts, but also some of the highest ridges in that portion of the State (those near Bloomington). It has here a thickness of but three to five feet, and is less pervious to water than typical loess. Along the outer portion of the newer drift in central and eastern Illinois, and low-lying districts in northeastern Illinois, there is not enough of this silt to conceal surface boulders, while over large districts the pebbly clays of the glacial drift are at the surface, and constitute the soil. This silt is probably, in part, a water deposit, but in certain cases its presence seems difficult of explanation on the theory of submergence, either general or local, and it may be necessary to call in the supplementary agency of wind in explaining its distribution.

After the ice sheet had withdrawn from Illinois the outlet of Lake Michigan, for a long time, was southwestward, across the site of Chicago to the Desplaines river. The lake then, for a time, stood about 55 feet above its present level, and formed a well defined beach at this stage. It covered not only the present site of Chicago, but extended west, slightly beyond the Desplaines river, to Maywood and LaGrange, and south, beyond the Calumet, to Conley's and Homewood, Illinois, and Dyer, Indiana. Blue Island Ridge stood above the surface of the lake, and so did an elevated tract southeast

of Willow Springs. (See Soil Map). As the lake subsided from this high level to the present, it halted sufficiently long to form well defined beaches at two levels—one beach being about 35 feet, and another 15 to 20 feet, above the present level. The low gravel ridges west and north from the Exposition grounds, were formed at the stage when the lake stood about 15 feet above the present level. They do not mark the extreme west shore of the lake, but were formed as bars some distance out from the shore, the west shore at that time being in the western part of Chicago. These bars, however, prevented wave action in the district west of them, and no beach deposits of consequence occur back of them. While this district was occupied by the expanded lake, soils were forming in the remainder of the State. This district from which the lake has recently withdrawn is, therefore, the youngest part of the State. According to estimates made by Dr. Edmund Andrews, based upon the present rate of transportation of sand past the Chicago piers, Lake Michigan has occupied its present level for less than 6,000 years. This estimate accords well with estimates on recession of falls in post-glacial time, made by Prof. N. H. Winchell and Mr. G. K. Gilbert.

## II. Classes of Soil.

It will be readily understood by anyone that in any given region there may be deviations of more or less consequence from the prevailing type of soil—deviations which may affect, to some extent, the value of the soil. Often an exceptionally good farm lies in the midst of an otherwise inferior agricultural district, or a poor farm may lie in a district where the land is of superior quality. Such deviations, even where known, cannot be represented upon a map of the scale here used, nor given individual attention. Only general classification can be made, and

approximate boundaries indicated. It is left to those interested in any particular district, to note the exceptions and fill out the outline.

The classification of soils which seems to best serve our purpose is based mainly upon physical characteristics. The following classes are represented: (1). Residuary soils, or soils formed from the underlying rock. (2). Stony or glacial clays. (3). Gravelly soils. (4). Sandy soils. (5). Loess or silt rapidly pervious to water. (6). Silts slowly pervious to water. (7). Fine silts nearly impervious to water. (8). Peaty or organic material.

(1). *Residuary Soils.* These soils show variations which correspond in a rude way with variations in the structure of the rocks, from which they are derived, there being in regions underlain by shale or limestone a more compact and adhesive soil than in sandstone regions, while each class of limestone has its own peculiar soil, and soils derived from shales range from stiff clay to a very sandy material. A complete analysis of the nature of the differences displayed by the several classes of residuary soils has not been made. With proper rotation of crops these soils constitute a fertile portion of the State, otherwise they become exhausted sooner than soils formed from glacial drift.

(2). *Stony or Glacial Clay.* Under this class is included the weathered surface of the drift-sheet wherever it was unaffected by water action during deposition, or was not subsequently coated by silt, sand, or other material. It includes the greater part of the surface of the newer drift-sheet between the Shelbyville moraine and Lake Michigan, and much of the earlier drift-sheet in the districts north of the sandy belts of the Green and Rock river valleys. The soils are very productive, being composed of a varied rock material, a large percentage of which is in a fine state of division. Where the surface of the

country is rolling all classes of grains and fruits suited to the latitude will flourish. On flat districts corn and grass are exceptionally productive.

(3). *Gravelly Soils.* Gravelly soils are varied in their method of deposition, occurring in lake beaches and along streams, in drift knolls and ridges, and beneath plains not now occupied by streams. In the last-named situation the plains are so related to the drift ridges as to show that they were occupied by glacial waters.

The beaches have generally a poor soil, but the gravel terraces along streams, especially those of glacial age, have as a rule a capping of loam several feet thick, which renders them productive. The same is often true of gravelly knolls and ridges. On the whole, the soils underlain by gravel possess more fertility than do the sandy soils. This superiority is, however, due to the capping of loam which constitutes the soil, or, as in the drift knolls and ridges, to an admixture of clay or earthy material with the surface portion of the gravel. The coarse fragments in the gravel can furnish but little sustenance to crops, although, by weathering, the stones may yield rich material to the soils and furnish a greater variety of plant food than could be obtained from a siliceous sand.

(4). *Sandy Soils.* The sandy soils, though much alike in structure, are varied in their methods of deposit. They occur in the beaches along the borders of Lake Michigan, in the valley bottoms of the main streams, on the bluffs and along the borders of the streams which lead away from the newer drift district, in basins within the newer drift district (as the Kankakee and Illinois-Vermilion), and to a limited extent in the drift ridges (moraine). There is also an extensive development of sand in north-western Illinois, in the Green river basin and the bordering districts, as far north as northern Whiteside county.

Where the sand is of medium to coarse grade it is usually rather barren, but where fine, as in the eastern portion of the sandy belt bordering the Illinois in Tazewell and Mason counties, it is very productive. Within the districts noted upon the map as sand-covered, there are more or less extensive tracts of wet, mucky land. This, where artificially drained, has often proved very productive. There are districts where the loess assumes a sandy phase, but in these places the sand is very fine, so fine that individual grains can scarcely be recognized, and the fertility is about as great as in the typical loess.

(5). *Loess or silts readily pervious to water.* This class of silt is confined mainly to the borders of the principal streams of the older drift district, though there is a somewhat extensive development within the newer drift area in the Bureau creek basin, as noted above. In southern Illinois the loess graduates into white clay in receding a few miles from the Mississippi, Ohio and Wabash rivers; in western Illinois into the slowly pervious silt described below, and in the extreme north it thins out, and the residuary clays come to the surface.

The loess is so well known as scarcely to need description. In this State it is occasionally fossiliferous and calcareous, but as a rule, fossils are rare, and lime is a subordinate element. The chief material is silica in a fine state of division, but with the silica are rock fragments of various kinds, especially of crystalline rocks. The loess is so porous that roots penetrate readily to a great depth (25–30 feet or more). It yields fair crops of all kinds, but is especially valuable for fruits, both orchard and small fruits. The physical condition of porosity seems to be the chief cause for the superiority of the loess and the other pervious silts, over the white clays and finer silts. Nothing has been found to indicate that the former contain a better supply of plant food than the

latter, while the fertility of the latter is made certain by the rich growth of such crops as will flourish in a compact soil.

(6). *Silts slowly pervious to water.* This class of silts embraces the rich black soil district of the western portion of the State. The southern boundary lies near a line connecting Alton, Litchfield and Pana. The eastern boundary of the main district may be placed at the border of the newer drift. The northern boundary is near the south border of the Green river basin, while the western boundary is found in the loess that borders the Mississippi. Through this district there passes the belt of typical loess which borders the Illinois, a belt only a few miles in width. Aside from this main district, there is considerable silt of this class between the Rock and Mississippi rivers, in northern Illinois, capping the earlier drift sheet.

On the newer drift, as stated above, silts slowly pervious to water cover large districts in central and eastern Illinois to a depth of several feet. In northeastern Illinois, such a silt capping is not a common feature.

Wherever silts of this class occur the vegetation is usually prairie grass, and there is a blackening of the soil by humus to a depth of several inches, often two feet or more. This class of silts gives rise to a highly productive soil. One which will yield fair returns even under most careless methods of farming. Corn and grass are the staple products, but other crops have a fair yield.

(7). *Fine silts, nearly impervious to water.* These silts are of two classes, white clay and gumbo. The first class covers the uplands of much of southern Illinois. The second is common in portions of modern river valleys, remote from the current and subject to overflow in periods of extreme high water, and has great extent along the Illinois and Mississippi river bottoms. A less

compact silt, found in river bottoms, is known as potato land.

The white clay is a pale colored deposit scarcely at all blackened by humus. It covers the greater part of the State south from a line running eastward from Litchfield, Illinois, to the Wabash valley, near Terre Haute, Indiana. It is so compact that much of the water stands on the surface until removed by evaporation, while in seasons of drouth scarcely enough water rises from below to supply the loss from evaporation. In the southeastern portion of the State there is, however, a looser soil less easily influenced either by excess or deficiency of rain. In that part of the State the surface is hilly and the drift so thin that the rock, in many places, comes sufficiently near the surface to have become uncovered by erosion and deeply weathered in post-glacial time.

There are extensive districts with very flat surface where the white clay soil is underlain at a depth of a few inches, with a ferruginous crust or ochery clay, which is exceedingly refractory, giving very slow access to air or water. In the greater part of the region, however, this crust is either absent or is so low down that it does not seriously affect the soil. With the exception of corn, which is liable to be injured by autumn drouths, the leading crops of the State do fairly well. Wheat yields as well as anywhere in the State, while orchards and small fruits bring very profitable returns. The soil needs careful attention, but there is every indication that where properly cared for it will become as profitable for agriculture as the soils which now enjoy a better reputation.

The surface of this white clay district is nearly equally divided between forest and prairie. The former borders the streams and the latter occupies the divides. Here,

as well as elsewhere in the State, the causes for the restriction of the forest are not fully understood.

(8). *Peaty and Organic Soils*. Such soils occur in basins or in poorly drained tracts, where rank vegetation becomes submerged at certain seasons and is thus prevented from atmospheric decay. This class of soils is much more abundant in the northern one-third of the State than further south. Peat bogs occur, however, south of the center of the State.

Many bogs are underlain by shell marl as well as by peat. The marl is seldom sufficiently pure or abundant to be used in the manufacture of lime.

In many instances the bogs, when drained and the peat given time to ripen and become warm, yield large crops of potatoes and other garden truck. Wheat or other crops requiring mineral food in the ripening of their grains, can scarcely be expected to grow on such soil until it becomes charged with earthy material by natural or by artificial processes.

## REPORT ON THE EXAMINATION OF SOME SOILS FROM ILLINOIS.

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BY MILTON WHITNEY.

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**S**OILS are derived from the disintegration of rocks. They consist of minute fragments of the rocks or of the minerals which compose the rock, or of some other minerals which have been formed by the chemical changes constantly going on in the soil. These small particles of mineral matters, although they seem to be very compact and continuous in the soil, have minute spaces between them, into which the water can enter. Soils contain, as a rule, about fifty per cent, by volume, of empty space, that is, a cubic foot of soil will contain about half a cubic foot of space, and will absorb about half a cubic foot of water. Coarse grained sandy soils usually have the smallest amount of empty space and fine grained, heavy clay soils, which really weigh less per cubic foot, have considerably more empty space, and will hold more water. The smaller these spaces are and the more uniform they are in size, the slower will water move through them, but the soil will have greater power for holding water and for drawing water up from below. This is the case in strong clay soils. There is a larger amount of space for water to be held in, and the mineral fragments composing the soil are extremely small, so that there are a large number of them in a cubic foot of soil, and the spaces between them are very small, making the soil very retentive of moisture, because the rainfall can only pass down through it very slowly and it can be drawn up again to the plants with considerable force. It should be noticed here, also, for

this is probably very important in the consideration of these fertile western lands, that the presence of large amounts of organic matter will have the same effect in making the soil retentive of moisture as a large percentage of clay, but if, through constant cultivation the organic matter is oxidized and used up, the lands will become more and more sandy in texture and less productive. Therefore, a heavy clay soil is stronger, more certain and more lasting than a virgin soil, depending for its retentive powers and its fertility upon the accumulation of organic matter.

These mineral matters composing the soil contain certain chemical elements required by plants, such, for example, as potash, phosphoric acid, lime, silica, alumina, etc. All soils, even very barren ones, contain at least a ton of each of these elements in one acre, to a depth of one foot, and they usually contain from two to twenty tons of each of these plant foods. With this vast quantity of food material the barrenness of soils cannot be due to the lack of plant food, and the deterioration of lands cannot be due to the loss of plant food, for it would be impossible for crops to remove so much plant food as this in the few years it takes for a soil to become worn out under improper methods of cultivation.

The prevailing ideas of plant nutrition have been based mainly upon the chemical composition of soils. When it was found that the chemical composition of a soil and plant did not show what was lacking in the soil for a large crop, it was held that only a small part of the plant food in the soil is at any one time in a form of combination which is available to plants; that the available plant food never accumulates as such in the soil, but quickly reverts to more insoluble forms, which are unavailable to plants. According to this idea the exhaustion of soils by continued cropping is due to the

actual loss of available plant food, removed by the crop or converted into an unavailable form by chemical changes in the soil. The chief use of fertilizers is to supply the plant with food which the soil fails to furnish. The reason certain plants do better on certain kinds of soil is assumed to be due to the fact that plants vary greatly in their powers of gathering their food from the soil and air, and that thus a rye plant would do well on a soil too poor to give a good yield of wheat.

Our investigations on the Maryland soil seem to show, however, that the texture and the physical conditions of the soils are of more importance than the chemical composition. It appears that under favorable conditions of moisture and temperature plants can readily gather sufficient food material from nearly all soils, but if these conditions of moisture and heat are changed the development of the plant will be greatly changed and it will take up more or less food from the soil. Soils differ greatly in their texture, that is, in the amount of sand and clay which they contain, and, as we have seen, this controls very largely the supply of moisture which they can maintain for the crop, with a given amount of rainfall. If there are four inches of rainfall a month a coarse sandy soil will allow most of this to run through very quickly, so that there may not be more than 5 or 6 per cent of water held in the soil for the crop, or say about 100 tons of water per acre one foot deep, and when this water is used up the soil has comparatively very little power to draw up more water from below for the use of the crops. With a compact clay soil, on the other hand, the water passes downward very slowly, and the soil will maintain about 18 or 20 per cent of its weight of water for the crop, or about 400 or 500 tons of water per acre one foot deep. In a dry season, also, the clay soil has more power of drawing up water from below and maintaining this supply. If a florist should

give a plant four times as much water as he gives another plant of the same kind, the two plants would develop very differently, and he uses this constantly to produce any kind of development he desires. If it is desired to have the plants flower or fruit, the soil is kept rather dry and cool. If it is desired to produce large, leafy plants, the soil is kept much wetter and warmer. To have equal success with different kinds of plants the amount of water must be carefully regulated according to the needs of the plants. Some plants require a much more abundant supply of water than others. This control of moisture and temperature is far more important than the mere chemical composition of the soil.

The texture of our various soils being different, they are enabled to maintain a variety of conditions of moisture, and they partake somewhat of these artificial conditions in a green-house, the conditions in each of the soils being best suited to the needs of certain classes of plants.

The amount of moisture which a soil can maintain for a crop, under given climatic conditions, will depend mainly, (1) upon the amount of space in the soil in which water can enter; (2) upon the extent of subdivision of this space, that is, upon the number of grains of sand and clay there are in a given volume of soil; (3) upon the arrangement of these grains, for, as already remarked, if the grains are symmetrically arranged, so that the spaces shall all be of uniform size, water will move through the soil much slower than if the spaces are of very unequal sizes; (4) upon the amount and condition of the organic matter in the soil. The grains of clay are so exceedingly small that their number vastly exceeds the number of the grains of sand and silt, so that the percentage of clay practically determines the extent of subdivision of the space, and it is thus the most important ingredient of the soil.

The mechanical analysis of soils consists of separating out the different grains of sand, silt and clay. Of these the most important is clay, for reasons just given. Before giving the mechanical analysis of the Illinois samples it will be interesting to say a few words as to the origin of these soils, for this has some bearing upon the texture.

There is only a small area of the old crystalline rocks in this country. Most of these old crystalline rocks have been disintegrated by the various forces concerned in the decay of rocks, and the material resulting from the disintegration of the rocks has been carried off by water, wind and moving ice, and deposited elsewhere as "sedimentary" material. The Illinois soils are of this sedimentary nature. The older crystalline rocks have long ago been worn away, and have been covered with this sedimentary material. When the original crystalline rock disintegrates grains of all different sizes may be produced, from coarse gravel to the finest grades of silt and clay. If this material is carried off by water and deposited near by there is likely to be a variety of soils formed, having very different textures. Some will have more of the coarser fragments, and others will have more of the finer material, according to the distance they will have to be carried and the circumstances under which they are deposited. When the material has to be carried further the deposits are more likely to be of uniform size.

In Maryland we have a broad area of these old crystalline rocks, in what is called the Piedmont Plateau, with mountains on one side, made up of sedimentary material, and still more recent sedimentary deposits of the coastal plain on the other side, which has not yet been consolidated into rock. All of these sediments had been laid down within a comparatively short distance of the old crystalline rock from which the material came. We have representatives of all the geological formations,

from the old crystalline rocks down to the most recent quarternary deposits. As these have been laid down near the source of supply from which the material was derived, and have not since been modified by glacial action, it happens we have a great variety of soil formations, and it is both interesting and instructive to see how the texture of these soils determines the kind of crop which it is best suited to grow. The mechanical analysis of representative samples from a number of these soil formations is given in the accompanying table, with the crops best adapted to them, for a basis of comparison with the Illinois soils.

### Mechanical Analysis of Maryland Soils.

Diameter. mm.	Conventional Names.	472. Early Truck.	467. Truck & fruit.	258. Tobac- co.	180. Wheat.	480. Grass.	173. Lime- stone.
2-1	Fine gravel..	0.49	0.76	1.53	0.00	0.00	0.54
1-5	Coarse sand..	4.96	8.55	5.67	0.00	0.38	0.32
.5-.25	Medium sand	40.19	35.04	13.25	0.48	1.07	0.72
.25-.1	Fine sand....	27.59	19.26	8.39	3.06	0.78	0.62
.1-.05	Very finesand	12.10	8.42	14.95	50.32	3.41	4.03
.05-.01	Silt .....	7.74	11.38	28.86	14.19	43.08	36.02
.01-.005	Fine silt.....	2.23	4.13	7.84	6.78	13.81	14.99
.005-.0001	Clay .....	4.40	10.59	14.55	20.28	30.21	41.24
Total mineral matter..		99.70	98.13	95.04	95.11	92.80	98.48
Organic matter, water loss.....		0.30	1.87	4.96	4.89	7.20	1.52

No.	Crop.	Geological formation.	Clay. Per cent.	Surface area sq. cm.	Approximate number of grains per gram.
472	Early truck.....	Columbia ....	4.40	615	1,950,000,000
467	Truck and fruit.	Columbia ....	10.59	1,244	4,767,000,000
258	Export tobacco..	Chesapeake...	14.55	1,902	6,786,000,000
180	Wheat.....	Chesapeake...	20.28	2,380	9,357,000,000
480	Grass.....	Cabbro.....	30.21	3,479	14,457,000,000
173	Strong grass and wheat.....	Trenton lime- stone.....	41.24	4,575	19,638,000,000

It must be remembered that these are very old soils, that is, they have been under cultivation for probably 200 years, and that the original store of organic matter has been used up long ago. We find that the first two samples are so light and sandy that they will not produce, even under the best system of cultivation, over five bushels of wheat per acre, so that practically wheat cannot be produced on them economically. These used to be considered very poor and barren soils and were almost worthless for agricultural soils, but since the introduction of truck farming these soils are the most productive in the State for early vegetables, as crops mature on them much earlier than on any other soil. Fifteen years ago these lands were worth not over \$4.00 or \$5.00 per acre, but now they are worth from \$50 to \$200 per acre, depending upon the location and the transportation facilities. The third sample (258) represents the finest type of tobacco land, producing a mild, bright colored pipe tobacco, which has been celebrated since the earliest colonial days. If the tobacco is grown on either of the other soils just mentioned, it has a finer texture and a brighter color, but it has not sufficient body. If, on the other hand, tobacco is grown on any of the heavier soils, the plants are large, coarse and sappy, they have too much body and do not take on color. The fourth sample (180) with about 20 per cent of clay, represents about the lightest textured land on which wheat can be economically produced with us. The remaining two samples are still heavier in texture and are well suited to both grass and wheat. The grains of sand and clay in these soils seem to have about the same arrangement, for the fertility of the lands is measured by the percentage of clay which they contain.

The mechanical analyses of the Illinois soils are given in the accompanying table, arranged in the order of Mr.

Leverett's classification of the geological formations from which they are derived. The texture of the boulder clay lands, as shown by the mechanical analysis, corresponds very closely with the wheat and grass lands of Maryland, although none of the samples are as rich in clay as the limestone soils of that State. There is this to be considered, however, that there is a larger amount of volatile matter in the Illinois soils, showing that they probably contain twice as much organic matter as the Maryland soils. This would tend to make them more productive than soils otherwise similar in texture. The terrace formations, with the exception of the rich bottom lands (1340), are almost identical in texture with the early truck and fruit lands of Maryland. They appear to be too light in texture for profitable wheat production, as they have not enough body to maintain a sufficient water supply for the crop. There is this consideration, however, in regard to the samples, if the lands lie low, so that it is but a short distance from the surface down to the water level, the land may be able to maintain a sufficient water supply, and they may thus be very fertile wheat lands. Or, if there is a hardpan or a layer of compact and impervious clay underlying the lands to prevent the rain water from passing down too readily, they may then become sufficiently retentive of moisture to make good wheat lands. There might also be sufficient organic matter in these lands to make up for the low percentage of clay, but this is not apparent from the analyses, and, if it were so, the lands would gradually deteriorate as the organic matter was oxidized and used up by continued cultivation. It is likewise possible that the grains of sand and clay are so arranged as to make these soils more retentive of moisture than the Maryland soils having a similar texture. In this case, also, they might be sufficiently retentive of moisture to make fertile wheat lands.

This arrangement of the grains could only be determined by experiments in the field, but it does not seem probable from our laboratory experiments that the arrangement of the grains differ materially from the arrangement in the Maryland soil. If there is no hardpan or impervious clay underlying these lands, and there is no more organic matter than appears from these analyses, and the grains of sand and clay are arranged in about the same way as with the Maryland soils, these lands should make very fine truck lands, as they would force the vegetables to an early maturity, which could command a high market price. The question of the ease and cost of transportation would, of course, have to be considered.

The above remarks apply also to the samples of the river loess. They are lighter in texture than our best wheat lands, although they have rather more organic matter to balance the low percentage of clay. They are more like our fruit and tobacco lands, although the higher percentage of volatile matters indicates that they are rather more retentive of moisture. To determine this would require some special investigations in the field.

Of the upland loess there are two types, those which are pervious to water and which are valuable agricultural lands; those which are compact and almost impervious to water, locally known as white clays, which are so very retentive of moisture as to be always wet, are of less agricultural value. The mechanical analysis shows that these two types of land are almost identical in texture, and that the white clays (1,321, 1,342, 1,343, and 1,345) have no more clay than the other samples of upland loess, which are considered very fertile lands. The wetness of these white clay lands, therefore, is not due to the fact that they contain more clay, but it must be ascribed to some other cause. They contain no more organic matter, so that it cannot be due to an excessive amount of this material. It must be due, therefore, to

one of two causes; either that there is a hardpan or a layer of impervious clay underlying these lands which retards the descent of the water and prevents the excess of rainfall being carried down, or it may be due to a difference in the arrangement in the grains. Our laboratory experiments do not seem to indicate that there is any material difference in the arrangement of the grains in these two classes of soils, but this can only be determined with certainty by investigation of the soils in their natural position in the field. If the pervious character of the white clays is due to a difference in the arrangement of the grains, the lands ought to be underdrained, so that the excess of water may be artificially removed, or the trouble may be greatly alleviated by liming the land, which will tend to make it more loamy and less retentive of moisture. The effect of kainit and of some of the phosphates would probably have a similar effect on the land if applied regularly for a number of years. If the soils are impervious because of a hardpan or a layer of impervious clay three or four feet below the surface, then fertilizers will do very little to correct the evil, unless the lands are systematically underdrained.

Of the three miscellaneous or unclassified samples, 1,306 was sent on as representing a sandy type of loess. The mechanical analysis, however, shows that this has no more sand than the other samples of loess, and that it contains, indeed, rather more clay than the average. If this really appears as a sandy type of loess it must undoubtedly be due to the arrangement of the grains of sand and clay in the soil, and this can readily be corrected by the use of fertilizers and manures. Sample 1,325 appears, from the mechanical analysis and a consideration of the locality from which it was derived, to be a true loess. Sample 1,339 is undoubtedly a modified drift, if not a lacustrine deposit.

The samples represented in this series cannot be considered soils and subsoils in an agricultural sense, but so far as they be classed as such and as far as the data goes, it appears that the subsoils of the glacial drift contain more clay than the corresponding soils. Thus, we have in three samples of soils, 24.31 and 21.70 and 23.37 per cent of clay, respectively, while the one sample of subsoil, said to be very characteristic of the region around Champaign, has 30.90 per cent of clay. This is the rule of the agricultural lands, that the subsoils are richer in clay than the corresponding soils, but this appears to be just the reverse of the conditions in the loess, as the following table shows:

No.	LOCALITY.	SOIL.	SUBSOIL.
1,315-6.....	Virginia City.....	15.34	6.15
1,317-8.....	Virginia City.....	15.15	7.10
1,307-8.....	Carrollton .....	23.65	12.52
1,368.....	Rock Island.....	12.08	.....
1,370.....	Gladstone.....	.....	8.31

**Mechanical Analysis of Illinois Soils.**  
**Glacial. (Boulder clay).**

Diameter. mm.	Conventional Names.	1334. Charles- ton. 1-18.	1369. Sheldon 6-12.	1333. Mar- shall Co. 1-15.	1327. San Jose. 1-18.	302. Cham- paign. 30-42.
2-1	Fine gravel.....	0.13	0.20	1.08	0.00	1.04
1-.5	Coarse sand.....	0.36	0.71	1.65	0.00	1.98
.5-.25	Medium sand.....	1.88	3.24	6.45	0.24	6.85
.25-.1	Fine sand.....	2.10	4.01	9.32	0.57	6.23
.1-.05	Very fine sand....	3.73	7.30	12.89	8.54	5.82
.05-.01	Silt.....	44.28	41.66	23.44	44.63	28.38
.01-.005	Fine silt.....	13.21	13.33	11.07	12.64	15.46
.005-.0001	Clay .....	21.70	23 37	24.31	26.57	30.00
Total mineral matter.....		87.41	83.82	91.84	93.19	95.64
Organic matter, water loss....		12.59	6.18	8.16	6.81	4.36
		100.00	100.00	100.00	100.00	100.00
Loss by direct ignition.....		9.65	8.24	8.16	5.77	.....

## Terrace Formations.

Diameter. mm.	Conventional Names	†b. 1344. Chris- tian Co. 1-18.	†b. 1346. Mason City. 2-21.	a. 1338. Chilli- cothe. 2-18.	b. 1332. Rock- ford. 1-15.	c. 1340. Ameri- can bot- toms. 1-12.
2-1	Fine gravel.....	0.00	0.00	0.16	0.26	0.00
1-.5	Coarse sand.....	0.00	0.01	4.70	2.62	0.00
.5-.25	Medium sand.....	8.69	3.30	47.51	23.52	0.03
.25-.1	Fine sand.....	54.87	41.44	13.55	20.44	0.13
.1-.05	Very fine sand.....	29.06	34.76	3.01	11.66	7.99
.05-.01	Silt.....	1.45	10.93	16.82	20.74	41.28
.01-.005	Fine silt.....	1.27	2.74	4.89	6.32	10.33
.005-.0001	Clay.....	3.66	3.87	5.61	8.29	30.42
Total mineral matter.....		99.00	97.05	96.25	93.85	90.18
Organic matter, water loss....		1.00	2.95	3.75	6.15	9.82
		100.00	100.00	100.00	100.00	100.00
Loss by direct ignition.....		1.24	3.64	3.68	5.34	9.82

- a. Terrace of glacial age.  
b. Flood deposit; †b, probably wind deposits.  
c. Post glacial terrace (bottom land of Mississippi.)

## River Loess.

Diameter. mm.	Conventional Names.	1316. Virginia City. 48-120.	1370. Glad- stone. 36-96.	1368. Rock Island. 1-6.	1347. Du- buque. 1-15.	1315. Virginia City. 1-16.	1312. Alton. 81-180.
2-1	Fine gravel ..	0.00	0.00	0.00	0.00	0.00	0.08
1-.5	Coarse sand ..	0.00	0.02	0.00	0.00	0.00	0.27
.5-.25	Medium sand.	0.01	0.04	0.02	0.04	0.31	1.32
.25-.1	Fine sand....	0.10	0.84	0.17	0.74	2.62	1.48
.1-.05	Very finesand	24.84	28.17	22.27	30.12	8.22	25.24
.05-.01	Silt.....	60.98	49.02	51.53	41.49	56.63	44.79
.01-.005	Fine silt.....	2.80	5.42	9.72	7.96	9.65	7.86
.005-.0001	Clay.....	6.15	8.31	12.08	14.44	15.34	15.57
Total mineral matter...		94.88	91.82	95.79	94.79	92.77	96.61
Organic matter, water loss .....		5.12	8.18	4.21	5.21	7.23	3.39
		100.00	100.00	100.00	100.00	100.00	100.00
Loss by direct ignition..		8.11	8.18	4.21	5.66	6.03	4.25

**Upland Loess.****a. Soils pervious to water.**

Diameter. mm.	Conventional Names.	1318. Virginia City. 60-120.	1308. Carroll- ton. 24-44.	1317. Virginia City. 4-48.	1307. Carroll- ton. 1-15.	1328. Wyo- ming. 1-15.
2-1	Fine gravel.....	0.00	0.00	0.00	0.00	0.00
1-.5	Coarse sand.....	0.00	0.10	0.00	0.00	0.00
.5-.25	Medium sand.....	0.00	0.87	0.00	0.01	0.02
.25-.1	Finesand.....	0.00	1.00	0.01	0.04	0.10
.1-.05	Very fine sand....	8.55	6.17	7.68	9.93	6.55
.05-.01	Silt.....	76.67	62.58	61.85	48.76	49.20
.01-.005	Fine silt.....	4.84	8.76	9.60	8.39	11.21
.005-.0001	Clay.....	7.10	12.52	15.15	23.65	23.94
Total mineral matter.....		97.26	92.00	94.29	93.78	91.02
Organic matter, water loss...		2.74	8.00	5.71	6.22	8.98
		100.00	100.00	100.00	100.00	100.00
Loss by direct ignition.....		4.19	4.16	5.87	6.14	9.52

**Upland Loess.****b. Soils compact and almost impervious to water.**

Diameter. mm.	Conventional Names.	1321. Green- ville. 2-15.	1342. Cumber- land Co. 1-12.	1345. Jeffers'n County. 2-15.	1343. Moawe- qua. 2-18.
2-1	Fine gravel.....	0.48	0.30	0.00	0.00
1-.5	Coarse sand.....	1.92	1.05	0.07	0.08
.5-.25	Medium sand.....	1.22	3.42	0.29	0.77
.25-.1	Fine sand.....	0.57	3.30	0.40	0.11
.1-.05	Very fine sand.....	5.08	6.47	6.38	4.88
.05-.01	Silt.....	59.06	55.48	56.92	52.50
.01-.005	Fine Silt.....	11.09	11.70	12.18	12.15
.005-.0001	Clay.....	14.12	14.90	17.06	22.10
Total mineral matter.....		93.54	96.62	93.30	93.39
Organic matter, water, loss.....		6.46	3.38	6.70	6.61
		100.00	100.00	100.00	100.00
Loss by direct ignition.....		5.59	3.11	4.49	5.73

**Miscellaneous.**

Diameter. mm.	Conventional Names.	a. 1306. Gallatia. 1-18.	b. 1325. Warren. 1-12.	c. 1339. Maywood. 1-15.
2-1	Fine gravel.....	0.00	0.00	0.30
1-.5	Coarse sand.....	0.00	0.00	0.58
.5-.25	Medium sand.....	0.02	0.14	2.14
.25-.1	Fine sand.....	0.30	0.19	3.48
.1-.05	Very fine sand.....	5.21	10.10	4.72
.05-.01	Silt.....	57.75	41.66	28.12
.01-.0051	Fine silt.....	12.78	11.97	14.33
.005-.0001	Clay.....	20.36	23.60	36.52
Total mineral matter .....		96.42	87.66	90.19
Organic matter, water loss.....		3.58	12.34	9.81
		100.00	100.00	100.00
Loss by direct ignition.....		6.01	13.12	10.28

- a. Sandy type of loess.
- b. Probably loess.
- c. Modified drift.

**Mr. Leverett's Classification of the Illinois Soils.****1. LACUSTRINE DEPOSITS (LITTORAL).. 1339****2. GLACIAL BOULDER CLAY—**

- a. True glacial till..... 1333 1234 1369 1335 302
- b. Modified drift..... 1327

**3. TERRACE FORMATIONS—**

- a. Terraces of glacial age..... 1338
- b. Flood deposits..... 1344 1332 1346
- c. Post-glacial terraces..... 1340

## 4. LOESS—

a. River loess.....	<u>1315</u>	<u>1316</u>	<u>1368</u>	<u>1370</u>	<u>1311</u>
	<u>1312</u>	<u>1347</u>			

## b. Upland loess (including white clays).

1. Allowing slow passage of water.....	<u>1328</u>	<u>1318</u>	<u>1317</u>	<u>1307</u>	<u>1308</u>
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2. Compact and almost imper- vious to water.....	<u>1343</u>	<u>1342</u>	<u>1345</u>	<u>1319</u>	1320
	<u>1321</u>				

3. Unclassified loess.....	<u>1306</u>	1309	1310	1313	1314
	1336	1337	1349	1365	1366
	1374	1375	1376	1377	

4. Sandy deposits.....	<u>1346</u>				
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5. BURIED SOILS AND UNDETERMINED. 1325 1322 1372

6. UNCLASSIFIED SAMPLES .....	1323	1329	1331	1341	1348
	1344	1324	1330	1326	1364
	1371	1373			

Total number of samples..... 58

Classified ..... 46

Unclassified ..... 12

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NOTE—The samples underscored were analyzed by Prof. J. A. Udden.

## List of Samples.

No.	Locality.	Depth.	Clay.	Geological Formation.
1334	Charleston.....	1-18	21.70	1. Glacial boulder clay.
1369	Sheldon.....	6-12	23.37	a. True glacial till.
1333	Marshall Co.....	1-15	24.31	" " " "
302	Champaign.....	30-42	30.90	" " " "
1335	Eldorado.....	1-12	.....	" " " "
1327	San Jose.....	1-18	26.57	b. Modified drift.
1338	Chillicothe.....	2-18	5.61	2. Terrace formations.
1344	Christian Co....	1-18	3.66	a. Terraces of glacial age.
1346	Mason City.....	2-24	3.87	b. Flood and wind deposits
1332	Rockford.....	1-15	8.29	" " " " " "
1340	Miss. bottoms...	1-12	.....	c. Post-glacial, (bottom
1316	Virginia City...	48-120	6.15	land) 3. Loess.
1370	Gladstone.....	36-96	8.31	a. River loess.
1368	Rock Island ....	1-6	12.08	" " " "
1347	Dubuque.....	1-15	14.44	" " " "
1315	Virginia City...	1-16	15.34	" " " "
1312	Alton.....	84-180	15.57	" " " "
1311	".....	1-60	.....	" " " "
1318	Virginia City...	60-120	7.10	b. Upland loess.
1308	Carrollton.....	24-48	12.52	1. Soils pervious to water
1317	Virginia City...	4-48	15.15	" " " " " "
1307	Carrollton.....	1-15	23.65	" " " " " "
1327	Wyoming.....	1-15	23.94	" " " " " "
1321	Greenville.....	2-15	14.12	2. Compact and almost im-
1342	Cumberland Co..	1-12	14.90	pervious to water.
1345	Jefferson Co....	2-15	17.06	2. Compact and almost im-
1343	Moweaqua.....	2-18	22.10	pervious to water.
1319	Madison Co....	4-16	.....	2. Compact and almost im-
1320	" ".....	24-60	.....	pervious to water.
				2. Compact and almost im-
				pervious to water.

## Mr. Leverett's Classification of the Illinois Soils.

No.	Locality.	Depth.	Clay.	Geological Formation.
1309	Montgomery Co....	1-18	.....	3. Unclassified loess.
1310	" ".....	18-48	.....	" " "
1313	Moweaqua.....	1-18	.....	" " "
1314	" ".....	24-42	.....	" " "
1336	Freeport.....	1-10	.....	" " "
1337	Marion.....	1-12	.....	" " "
1340	Madison Co.....	24-48	.....	" " "
1365	Springfield.....	1-20	.....	" " "
1366	" ".....	60-72	.....	" " "
1374	Union Co.....	12	.....	" " "
1375	" ".....	.....	.....	" " "
1376	" ".....	6-12	.....	" " "
1377	" ".....	.....	.....	" " "
1306	Gallatia.....	1-18	20.36	4. Unclassified samples.
1325	Warren.....	1-12	23.60	" " "
1339	Maywood.....	1-15	36.52	" " "
1322	Greenville.....	60-84	.....	" " "
1372	Taylorville.....	96-120	.....	" " "
1323	Greenville.....	4-24	.....	" " "
1329	Red Bud.....	1-12	.....	" " "
1331	Carrollton.....	1-18	.....	" " "
1341	Gladstone.....	36-96	.....	" " "
1343	Montgomery Co....	24-40	.....	" " "
1344	Christian Co.....	1-18	.....	" " "
1324	Rohley.....	1-20	.....	" " "
1330	Vienna.....	1-36	.....	" " "
1326	San Jose.....	1-12	.....	" " "
1364	DeKalb Co.....	1-12	.....	" " "
1371	Litchfield.....	4	.....	" " "
1373	" ".....	.....	.....	" " "

**APPROXIMATE NUMBER OF GRAINS OF SAND, SILT AND CLAY IN ONE GRAM  
OF SUBSOIL FROM ILLINOIS.**

**Glacial. (Boulder Clay.)**

Diameter mm.	Conventional Names.	1334. Charleston. 1-18.	1869. Sheldon. 6-12.	1883. Marshall Co. 1-18.	1897. San Jose 1-18.	302. Champaign. 3-12.
2-1	Fine gravel....	0	1	3	0	2
1-5	Coarse sand....	7	13	31	0	28
.5-25	Medium sand..	284	472	959	35	955
.25-.1	Fine sand.....	2,507	5,750	13,660	822	8,753
.1-.05	Very fine sand..	73,480	132,900	239,600	156,600	104,100
.05-.01	Silt.....	13,530,000	11,860,000	6,816,000	12,800,000	7,907,000
.01-.005	Fine silt.....	238,100,000	242,800,000	206,000,000	231,700,000	276,100,000
.005-.0001	Clay.....	10,800,000,000	10,830,000,000	11,520,000,000	12,410,000,000	14,090,000,000
Total...	.....	11,071,706,348	11,084,819,136	11,733,070,253	12,654,657,457	14,374,100,838

Terrace Formations.

Diameter. mm.	Conventional Names.	<sup>a</sup> b. 1344. Christian Co. 1-18.	<sup>a</sup> b. 1346. Mason City. 2-24.	<sup>a</sup> . 1338. Chillicothe. 2-18.	<sup>b</sup> . 1332. Rockford. 1-15.	<sup>c</sup> . 1340. Americ'n Bottoms. 1-12.
2-1	Fine gravel.....	0	0	0	1	0
1-5	Coarse sand....	0	0	83	48	0
.5-.25	Medium.....	1,200	465	6,755	3,428	5
.25-.1	Fine sand.....	74,600	57,450	18,680	29,300	194
.1-.05	Very fine sand..	501,400	611,900	53,470	212,400	151,400
.05-.01	Silt .....	391,200	3,007,000	4,670,000	5,888,000	12,230,000
.01-.005	Fine silt.....	21,920,000	48,250,000	86,860,000	115,100,000	195,600,000
.005-.0001	Clay .....	1,608,000,000	1,735,000,000	2,537,000,000	3,842,000,000	14,680,000,000
Total...	.....	1,630,888,400	1,786,926,815	2,628,608,968	3,963,232,177	14,887,981,599

a. Terrace of glacial age.

b. Flood deposits. <sup>a</sup>b. Probably wind deposits.

c. Post-glacial terrace (bottom land of Mississippi).

*Approximate Number of Grains of Sand, Silt and Clay in One Gram of Subsoil from Illinois.—Continued.*

**River Loess.**

Diameter. mm.	Conventional Names.	1316. Virginia City. 48-120.	1370. Gladstone. 36-196.	1368. Rock Island. 1-6.	1347. Dubuque. 1-15.	1315. Virginia City. 1-16.	1312. Alton. 84-180.
2-1	Fine gravel ..	0	0	0	0	0	0
1-.5	Coarse sand..	0	0	0	0	0	5
.5-.25	Medium sand.	1	6	3	46	46	189
.25-.1	Fine sand....	142	1,231	238	1,051	3,799	2,061
.1-.05	Very fine sand	447,500	524,200	397,100	543,000	151,400	446,400
.05-.01	Silt .....	17,170,000	14,260,000	14,370,000	11,960,000	16,290,000	12,380,000
.01-.005	Fine silt.....	50,430,000	100,900,000	173,400,000	143,600,000	177,600,000	139,100,000
.005-.0001	Clay .....	2,819,000,000	3,937,000,000	5,477,000,000	6,627,000,000	7,191,000,000	7,001,000,000
Total..	.....	2,887,047,643	4,052,685,437	5,665,167,341	6,783,104,057	7,385,045,245	7,152,928,655

*Approximate Number of Grains of Sand, Silt and Clay in One Gram of Sub soil from Illinois.—Continued.*

### Upland Loess.

a. Soils pervious to water.

Diameter. mm.	Conventional Names.	1318. Virginia City. 60-120.	1308. Carrollton. 24-48.	1317. Virginia City. 4-48.	1307. Carrollton. 1-15.	1328. Wyoming. 1-15.
2-1	Fine gravel. . . .	0	0	0	0	0
1-.5	Coarse sand. . . .	0	2	0	0	0
.5-.25	Medium sand . .	0	129	0	1	3
.25-.1	Fine sand. . . . .	0	1,462	14	57	148
.1-.05	Very fine sand. .	150,300	114,600	139,200	180,500	122,900
.05-.01	Silt. . . . .	21,060,000	18,170,000	17,110,000	13,890,000	14,440,000
.01-.005	Fine silt. . . . .	85,020,000	162,700,000	174,000,000	153,000,000	210,400,000
.005-.0001	Clay. . . . .	3,170,000,000	5,916,000,000	6,985,000,000	10,970,000,000	11,440,000,000
Total. . . . .		3,276,230,300	6,096,986,193	7,176,249,214	11,137,070,558	11,664,963,051

*Approximate Number of Grains of Sand, Silt and Clay in One Gram of Subsoil from Illinois.—Concluded.*

### Upland Loess.

b. Soils compact and almost impervious to water.

Diameter. mm.	Conventional Names.	1321. Greenville. 2-15.	1342. Cumberland Co. 1-12.	1345. Jefferson Co. 2-15.	1348. Mowqua. 2-18.
2-1	Fine gravel.....	1	1	0	0
1-5	Coarse sand.....	35	18	1	1
.5-25	Medium sand.....	178	453	42	113
.25-.1	Fine sand.....	65,130	4,595	577	13,110
.1-.05	Very fine sand.....	92,790	114,400	116,900	87,280
.05-.01	Silt.....	16,870,000	15,340,000	16,290,000	15,020,000
.01-.005	Fine silt.....	202,100,000	206,900,000	221,800,000	221,600,000
.005-.0001	Clay .....	6,564,000,000	6,707,000,000	7,948,000,000	10,300,000,000
Total....	.....	6,783,128,134	6,929,359,497	8,186,206,520	10,536,722,504

Export Item	Quantity	Value	Country of Origin	Destination	Mode of Transport	Remarks
Wheat	1000000	10000000	USA	Japan	Sea	
Soybeans	500000	5000000	USA	Japan	Sea	
Cotton	200000	2000000	USA	Japan	Sea	
Iron Ore	100000	1000000	USA	Japan	Sea	
Crude Oil	50000	5000000	USA	Japan	Sea	
Grain	300000	3000000	USA	Japan	Sea	
Meat	100000	1000000	USA	Japan	Sea	
Fish	50000	500000	USA	Japan	Sea	
Vegetables	20000	200000	USA	Japan	Sea	
Fruit	10000	100000	USA	Japan	Sea	
Flowers	5000	50000	USA	Japan	Sea	
Textiles	100000	1000000	USA	Japan	Sea	
Electronics	50000	5000000	USA	Japan	Sea	
Automobiles	10000	10000000	USA	Japan	Sea	
Planes	500	50000000	USA	Japan	Sea	
Ships	100	100000000	USA	Japan	Sea	
Spacecraft	10	1000000000	USA	Japan	Sea	
Artillery	1000	100000000	USA	Japan	Sea	
Tanks	500	50000000	USA	Japan	Sea	
Warships	100	1000000000	USA	Japan	Sea	
Submarines	50	500000000	USA	Japan	Sea	
Missiles	10000	1000000000	USA	Japan	Sea	
Naval Weapons	5000	500000000	USA	Japan	Sea	
Aircraft	1000	100000000	USA	Japan	Sea	
Armored Cars	500	50000000	USA	Japan	Sea	
Trucks	10000	100000000	USA	Japan	Sea	
Jeeps	5000	50000000	USA	Japan	Sea	
Motorcycles	10000	10000000	USA	Japan	Sea	
Bicycles	50000	5000000	USA	Japan	Sea	
Boats	1000	10000000	USA	Japan	Sea	
Yachts	500	50000000	USA	Japan	Sea	
Small Craft	10000	10000000	USA	Japan	Sea	
Lifeboats	500	5000000	USA	Japan	Sea	
Life Rafts	1000	10000000	USA	Japan	Sea	
Life Preservers	5000	5000000	USA	Japan	Sea	
Life Jackets	10000	10000000	USA	Japan	Sea	
Lifebuoys	5000	5000000	USA	Japan	Sea	
Life Rings	1000	10000000	USA	Japan	Sea	
Life Mats	500	5000000	USA	Japan	Sea	
Life Blankets	1000	10000000	USA	Japan	Sea	
Life Suits	500	5000000	USA	Japan	Sea	
Life Caps	1000	10000000	USA	Japan	Sea	
Life Boots	500	5000000	USA	Japan	Sea	
Life Gloves	1000	10000000	USA	Japan	Sea	
Life Socks	500	5000000	USA	Japan	Sea	
Life Shoes	1000	10000000	USA	Japan	Sea	
Life Hats	500	5000000	USA	Japan	Sea	
Life Belts	1000	10000000	USA	Japan	Sea	
Life Buckles	500	5000000	USA	Japan	Sea	
Life Buttons	1000	10000000	USA	Japan	Sea	
Life Zippers	500	5000000	USA	Japan	Sea	
Life Straps	1000	10000000	USA	Japan	Sea	
Life Laces	500	5000000	USA	Japan	Sea	
Life Ties	1000	10000000	USA	Japan	Sea	
Life Scarves	500	5000000	USA	Japan	Sea	
Life Gloves	1000	10000000	USA	Japan	Sea	
Life Socks	500	5000000	USA	Japan	Sea	
Life Shoes	1000	10000000	USA	Japan	Sea	
Life Hats	500	5000000	USA	Japan	Sea	
Life Belts	1000	10000000	USA	Japan	Sea	
Life Buckles	500	5000000	USA	Japan	Sea	
Life Buttons	1000	10000000	USA	Japan	Sea</	

1. The first group of authors (e.g., [1, 2]) considers the problem of the stability of the motion of a system of particles in the field of a central body. The results of these studies are used in the theory of the motion of celestial bodies.

arranged in 1882 for the Lincoln Road at York, Pa. Company and  
the West of York Road and a line of road to the West of York

[illegible]



## A GEOLOGICAL SECTION ACROSS THE NORTHERN PART OF ILLINOIS.

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BY PROF. J. A. UDDEN.

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### Introductory.

NO better line could be chosen for the construction of a section running east and west, to illustrate the geological structure of the State of Illinois, than the line following the Chicago, Rock Island & Pacific Railroad from the Mississippi river to the Indiana line on the east. Most of the State is drift-covered, and exposures of the bed-rock are often few in the uplands, and occasionally also scarce in the lowlands. Data for determining the position of the deeper formations are mostly only to be had in exposures along the water courses and from well-drillers. Most of the deeper borings now made are intended for artesian purposes, and are most frequently met with on the lowlands along the larger rivers. Here, only, are found data for the construction of geological sections.

A glance at the map of the State is sufficient to show us why the sections constructed by the earlier geologist mostly run north and south. The Mississippi, the Illinois, the Wabash, and even Rock river, have their general trend in this direction. But it may also be noticed that eastward from Rock Island county, a line may be extended in such a way as to follow one of three rivers for the greater part of the distance across the State. These rivers are the Mississippi, Green, and Illinois. A closer examination of this line will show that, even where rivers are wanting, the topography along the line is favorable for making geological observations.

Beginning at Rock Island, we first follow the south bluff of the Mississippi for a distance of about seven miles. At Port Byron Junction we turn a little to the south and trace our line along the south bluff of an alluvial bottom known as Pleasant Valley, which connects the bottom lands of the Mississippi with those of Rock river. Crossing the latter stream at Colona, and also crossing Green river, we proceed, with extensive lowlands on our left, due east, below the gently-marked bluff line on the south of this river, for a distance of thirty-three miles, until we come to Sheffield, where Green river turns to the north. Here the lowlands of this river are succeeded by a wide swale, which turns to the south-east, crossing a great moraine and extending for some eight miles. At this point we strike the branches of Bureau creek and nine more miles southeast, along this creek, bring us down to the Illinois river. For the next fifty-eight miles we may then go nearly due east, under the often steep bluffs on the north side of this river, until we are at a point nearly due south of Minooka. From this point we may still proceed east, for about five miles, on the lowlands between the Kankakee and the Desplaines rivers; but here, if we do not wish to turn either north or south and follow one of the two rivers, we have to ascend the slope of another moraine, and the remaining thirty-three miles take us over highlands, presenting, for the most part, only gentle reliefs and few exposures of the bed-rock.

The line here described was chosen by Dr. J. Lindahl as one particularly well suited to exhibit the geological structure of the State, and as one yielding more data than any other line across the State. It follows the route of the Chicago, Rock Island & Pacific Railroad from Rock Island to Minooka. A survey was made, and all the topographic and stratigraphic data obtainable were secured. A section was then constructed on the scale of

one-half inch to the mile, horizontally, and one inch to five hundred feet, vertically. We will here briefly discuss the most important features of this section.

### **The Superficial Features of the Section.**

Not more than twenty rods southeast from the Union Depot at Rock Island, there is an old quarry in the Devonian limestone. A closer examination of the beds in this place, reveals below:

(a). A ledge of unfossiliferous, compact, white, or slightly dove-colored, limestone. Three feet of this is exposed near the east end of the quarry, and about five feet near the west end. It has small crevices which are lined with iron pyrites, and near the top there are nodular masses of a mortar-like composition, consisting of a matrix of carbonate of lime, in which there are a few grains of quartz sand. Occasionally it acquires a brecciated appearance.

(b). Next above this there are four ledges, each a little more than two feet in thickness, of a hard and tough limestone, somewhat less fine in its texture and rich in fossil corals. In the upper part it becomes somewhat shaly.

(c). This is followed by about twenty-four feet of beds of shaly limestone and calcareous shale, full of fossil brachiopods and some corals.

The quarry is in an outlier of the upper part of the Devonian rocks, which have, for the most part, been carried away by erosion. Proceeding east, the erosion is found to have extended seventy feet below the top of this outlier, a well on Dr. Gordon's property, close to the river, having passed through a black shale to that depth before striking the Devonian limestone. This shale is connected with a coal seam, fire clay, and arenaceous beds, which appear in several exposures in the vicinity and constitute the scattered outliers of the base of the

coal measures. The unfossiliferous beds of the Devonian limestone soon appear again, and its surface is a horizontal plane twenty feet above the level of the Mississippi for the next three miles to the east. East of Moline, near the old Deere farm, there is another small outlier of the upper ledges of the Devonian rock. The top of the bed "a" is seventeen feet higher than at Rock Island, showing a small dip towards the west. At East Moline, the limestone disappears under the base of the coal measures and is not seen again along the bluffs.

At Carbon Cliff, the beds "b" have been encountered in some wells at an elevation of 580 feet A. T., showing that there is no extensive tilting of these beds either east or west. The coal measures cover the limestone in the bluffs west of this place with a thickness of nearly seventy-five feet, but the erosion in the Rock river valley seems to have just reached the plane of the contact between the two formations, and the outcrops in this part of the valley and in the bed of the river are exposures sometimes of Devonian limestone and sometimes of carboniferous sandstone. This is also true of the lowlands for several miles to the east of Colona. From records of borings and shafts around Colona it appears that the level at which the upper surface of the limestone is found is not always the same, but it varies from twenty to sixty feet below the general level of the bottom lands. Five miles farther east the beds "a" of the Devonian limestone have been quarried in the bed of Green river. Their thickness at this place is probably not very great, for only three miles farther north the Silurian limestone forms the bed-rock in Rock river.

As we come nearer Geneseo the coal measures become thicker and continuous, their upper surface rising in the series and their base descending in altitude, until we come to Tiskilwa, in Bureau county, or some distance east of this place. It should be remembered, however,

that the upper surface of the coal-measures is by no means an even plane, but presents even greater reliefs than the present topography of the land. Thus we find in the valley of Spring creek, east of Geneseo, the drift having a thickness of from 60 to 70 feet, while on the higher land at Atkinson the coal measures come up to within a few feet of the surface, the drift being thicker over the low lands along Green river and its tributaries than on the low swells approaching the river between the latter. Again, along the extensive lowlands of Mud creek we find the coal measures covered by considerable thickness of drift until we pass Mineral slough and ascend the gentle slope to the east.

This excavation of the coal measures under the lowlands has removed the greater part of the two coal seams, which occur at the level of about 100 feet above the base of the series, leaving them only in the low swells which extend northward from the high prairie on the south between the main tributaries of Green river. The gradual increase in thickness of the coal measures eastwards along this section may be seen from the following table:

Thickness of coal measures at Geneseo.....	60 feet
“ “ “ “ “ Atkinson.....	130 “
“ “ “ “ “ Annawan.....	139 “
“ “ “ “ “ Sheffield, (estimated).....	290 “
“ “ “ “ “ Tiskilwa (partly estimated). ..	400 “

Near the city of Tiskilwa the coal measures disappear under a heavy deposit of drift, the surface of which rises no higher than the general level to the west. The last seen of them is in the Rocky Run, west of Tiskilwa. In this creek there are huge blocks of a ledge of limestone belonging to the coal measures. These blocks have not been far removed from their original site. In several places they bear the marks of ice-scoring, and in one instance the scored blocks were evidently nearly in situ, being but little tilted.

For the next ten miles, in the valley of the Bureau creek and along the Illinois river, there are no outcrops of bed rock of any kind. In the country to the north of our section a number of borings have been made, and the coal measures have been struck at a depth ranging from 440 feet below the surface at Princeton to 50 feet below the surface in the bottom lands a little to the northeast of the city of De Pue. Just a little west of the mining town of Loceyville the coal measures again make their appearance in the north bluffs of the Illinois river, and at Spring Valley, three miles east of this place, they rise to a height of at least seventy-five feet above the level of the river. Proceeding in this direction the drift is noticed to diminish in thickness until we come to LaSalle, where the coal measures rise fully 150 feet above the river, just north of the city. Crossing the Little Vermillion, we see the limestone ledges in the coal measures slowly rising, with a dip to the west of less than  $2^{\circ}$  for about one mile. But here the dip increases, and for the next quarter of a mile it varies in different places from  $5^{\circ}$  and  $6^{\circ}$  to  $12^{\circ}$  and  $13^{\circ}$ , averaging perhaps  $10^{\circ}$ . About 500 feet west of the west end of the railroad tunnel the base of the coal measures is seen to come up above the level of the road-bed and ascend at first a gentle slope formed by the upper surface of the Silurian rocks, the uppermost visible member of which is the Trenton limestone. The coal measures are composed of fragmentary material. There are pieces of white and black chert, blocks of sandstone and limestone, etc., imbedded in a clayey base. Upward this changes into the regular coal bearing clays and sand stones. The dip of the Trenton is on the average  $18^{\circ}$  to the west and, as it runs along the railroad track for a distance of 205 feet, the exposure exhibits the lower 60 feet of the formation. A short distance from the west end of

the tunnel, the St. Peter sandstone in its turn rises above the railroad bed. It dips in the same direction, but the tilting is somewhat irregular, measuring in one place  $18^{\circ}$ , and in other places  $20^{\circ}$ ,  $26^{\circ}$ ,  $27^{\circ}$ ,  $23^{\circ}$ ,  $22^{\circ}$  and  $19^{\circ}$ . The average dip is perhaps  $22^{\circ}$ . This sandstone runs along the railroad for a distance of 300 feet with this dip. At the east end of the tunnel the lower part of the formation is concealed and its total thickness cannot be measured, but as its dip is very much decreased in the exposures which are seen close by, to the east, it is not likely that this thickness exceeds 175 feet. For one-half mile to the east of the tunnel the dip is still to the west and the Magnesian limestone rises in the bluffs at a low angle. At about this place, a few rods west of the cement works, the dip changes to the east. The highest point in the low anticline is a few rods west of the cement works. At this place there are exposed nearly 80 feet of the Magnesian limestone. Following the north bluff of the river, we notice the line of contact between the Magnesian limestone and the St. Peter sandstone descending until the former disappears and the latter makes up the greater part of the bluff. In the course of a mile and a half the descent is about 75 feet, and at Utica this line is only a few feet above the railroad level, the total descent in eight miles being about 130 feet.

A mile and a half east of Utica the coal measures again make their appearance in the bluffs, capping the St. Peter sandstone, first by a very thin remnant, and farther east by a thickness of some 60 or 70 feet of shales, near the bottom of which there is a workable seam of coal, which has been mined by stripping at several points along the section. In some places the coal can be seen to rest almost on the bare Silurian sandstone, and in other places it is separated from this

by a few feet of fire clay. At Ottawa the erosion of the river valley extends a little below the contact of the coal measures and the St. Peter sandstone. To the east of the city coal measure clays begin to cover it, and the sandstone soon passes out of sight. The river bluffs, which, between LaSalle and Ottawa, form a low but mostly vertical escarpment, here change their nature and present gentler slopes and well rounded contours. For the first five miles east of Fox river we find dark shales with thin seams of coal, which are seen successively at lower levels in the ravines. About a mile west of the city of Marseilles the shales are succeeded by a sandstone, which reaches a thickness of about 50 feet northeast of the city, but afterwards thins out and descends so as to form only an inconsiderable feature in the bluffs. As the strata of the coal measures slowly descend in this part of the section, the drift again acquires a greater thickness, having formed an inconspicuous capping only for most of the distance between LaSalle and Marseilles. Some distance west of Seneca its total thickness is not less than 100 feet in the uplands, and for several miles it forms nearly all of the bluffs east of Seneca, but as we come nearer to Morris, low outcrops of coal measures again appear in the low lands. These continue with interruptions for a few miles to the east of the city. The drift has been nearly all removed in the lowlands about Morris, and coal has been stripped in several places near the city and at other places mined at a short distance from the surface of the ground. About three miles northeast of this city, a short distance to the north of where the Rock Island road crosses Au Sable creek, the Trenton limestone crops out in the lowland, but following this creek eastward we find that it runs over coal measure sandstone for two miles, or a little more, perhaps, when this is again followed by

a Silurian limestone, which, however, belongs to the Cincinnati series. The railroad here ascends the outer slope of a moraine, near the summit of which is located the town of Minooka. The thickness of the drift in this moraine is about 130 feet, concealing from our view the bed rock, which, however, again appears in the lowlands along the DuPage river, consisting of limestone belonging to the Cincinnati series, alternating with shales of the same age and often presenting glacial scorings on its upper surface. Following the railroad four miles east of this river the Cincinnati rocks disappear under the base of the Niagara limestone which forms the bed rock for the remainder of the distance to the city of Chicago.

If, instead of following the railroad in its northeast course from the crossing of Au Sable creek, we proceed eastward along the Illinois river and its headwaters, the DesPlaines and the Kankakee, we find in the lowlands near the junction of the two last rivers that the bed rock consists of occasional outliers of the coal measures, filling depressions in the upper surface of the Cincinnati series of limestone and shales. The remnants of the coal measures become smaller and less numerous as we go east, and about two miles east of the junction of the headwaters of the Illinois there is a low rise in the land, which marks the western limit of the Niagara limestone, under which the Cincinnati series disappears. The contact is seen some distance to the north of our section in Jackson creek along the line of the Chicago, Alton & St. Louis railroad. From this point we ascend the slope of a moraine, and for the next five miles the bed-rock is mostly concealed, the drift varying from 130 to 50 feet in thickness.

About two miles west of Manhattan the drift is thin and several exposures are seen of the Niagara limestone, some in the upland and some along the streams. This

continues for a half mile to the east of Manhattan, where our section runs up against the south bend of still another moraine which covers the rock, sometimes to a depth of 200 feet, for the greater part of the remainder of the section.

### **The Stratigraphy of the Section.**

#### **THE DRIFT.**

The drift exhibited along the section may properly be divided into three divisions: alluvium, loess and boulder clay. The alluvium varies in its character in different valleys, and must, no doubt, be referred to different sub-epochs of post-glacial history. We shall not discuss the most recent phases which are to be seen along every stream in the State. In Pleasant Valley we find it consisting of a fine sand, the surface of which is at least fifteen feet above the highest stage of water known in either the Mississippi or Rock river. It appears to have been deposited at a time when the main channel of the Mississippi followed the lower channel of Rock river, and it may possibly belong to a terrace formation which seems to have been formed during the last epoch of glaciation of this continent. A similar sand occurs near the mouth of Green river south of the town of Colona, and continues in the low banks of sand which skirt the bottom lands of Rock river as well as Green river east and northeast of this place.

The loess is best developed in the west end of the section. Near Rock Island its thickness approaches 40 feet. At this place it is occasionally stratified, exhibiting seams of a fine sand in its lower part. Near the town of Colona it is not as heavy, but mostly a little coarser, especially near the surface. This is particularly the case on top of the bluffs, bounding the highland between Rock river and Green river. On the north side this

sandy loess forms an irregular ridge some 20 or 30 feet higher than this highland, and along the bottom land north of Green river is a similar but less pronounced accentuation of the bluff. The formation presents similar features south of Green river, eastward past Geneseo. Proceeding in this direction it becomes thinner, and finally disappears, occurring in isolated places as far as Sheffield. Over the rest of the section the typical loess is absent, but the boulder clay is covered in many places with a layer of silt from 2 to 10 feet in thickness. In the neighborhood of Wyandot this silt is somewhat sandy, and farther north its appearance is much like the sandy loess in Henry county. In the drainage area of Bureau creek its appearance is often so very much like that of loess that it cannot be distinguished from it. It seems to cover nearly all of the upland in Bureau county, but along the east end of the section it occurs mostly in isolated places.

Under the base of the loess, in the west end of the section, there is often found a silt, sometimes dark and sometimes greenish or whitish in color, and mostly known by well-diggers as "sea mud," "grandmother's garden," or the "forest bed." In it are often found pieces of branches of trees and logs and other remnants of decayed vegetation, snail shells, and remains of large mammals.

Below the loess and the forest bed lies the boulder clay. This is composed of a finely ground mass of clay, sometimes whitish, sometimes bluish, and sometimes of a buff color, containing sand, gravel, pebbles and boulders of all sizes and of a great variety of material. The proportion of the fine and the coarse material varies greatly. Generally the boulder clay has no marks of stratification, but in various localities it shows the most perfect sorting and bedding. It varies in thickness from

0 to 450 feet, and along the whole section it displays a tendency to develop its greatest thickness in depressions in the bed-rock. To this general rule, there are several exceptions, especially towards the east. As to the nature of the material of which the boulders are composed it may be said that eastward from Sheffield there is a greater proportion of limestone than westwards from this place, in fact the boulder clay in the west end of the section is more thoroughly ground up and contains smaller and fewer boulders. Between Wyanet and Loceyville stratification is a common feature in the boulder clay, and quite often the material is seen to be cemented together so as to form a solid mortar rock, the cementing material being in most cases carbonate of lime, often quite pure but sometimes ferruginous. The mortar rock is known by well-drillers as "hard-pan." In the Bureau creek valley the lower part of the drift is composed of sand and gravel.

Below the boulder clay and its assorted materials there has been found in some borings a fine, bluish or reddish silt, somewhat like loess in appearance, and resting on the bed-rock.

### **The Coal Measures.**

The highest beds in the coal measures series are seen at LaSalle, north of the city. They consist of variously colored shales, alternating with thin seams of limestone and carbonaceous material. A section taken at this place is as follows:

## SECTION AT LASALLE.

	A. T.
(1). 37 feet variously colored shales.....	580-543
(2). 1 foot blue limestone (weathering red).....	543-542
(3). 2 feet bituminous shale and coal.....	542-540
(4). 32 " variously colored shales.....	540-508
(5). 20 " limestone.....	508-488
(6). 3 " bituminous shale and coal.....	488-485
(7). fire clay (sometimes absent).....	_____
(8). 17 " shale.....	485-468
(9). 2 " limestone (several feet concealed).....	468-466
(10). shales.....	_____

NOTE: In the following pages these numbers refer to the elevation above the level of the sea in feet, a minus sign (—) being used when the section is below the sea level. The levels were obtained by aneroid measurements checked to the nearest known level.

In the bluff at Loceyville there are exposed some beds which may probably belong to a lower horizon. A section of the greater part of the bluff at this place is as follows:

## SECTION AT LOCEYVILLE.

	A. T.
(1). 7 feet limestone.....	527-520
(2). 26 " bluish shale.....	520-494
(3). 2 " limestone.....	494-492
(4). shale (mostly concealed).....	_____

About a mile west of Tiskilwa in the Rocky Run, the following exposure is seen:

## SECTION IN ROCKY RUN, TISKILWA.

	A. T.
(1). 40 feet sandy shales.....	674-634
(2). 4 " shales with nodular seams of ferruginous limestone.....	634-630
(3). 2 " coal.....	630-628
(4). Probably several feet of limestone.....	_____

A limestone which cannot be far below the base of this section is broken up into huge blocks which are seen in the bottom of the creek. This limestone is probably identical with the upper limestone in the previous section.

Near Sheffield the following section is seen:

#### SECTION IN COAL CREEK, SHEFFIELD.

A. T.

- |      |                                                                                                               |         |
|------|---------------------------------------------------------------------------------------------------------------|---------|
| (1). | 12 feet micaceous sandstone thin bedded, often rippled-marked, with ferruginous nodules, indurated below..... | 683-671 |
| (2). | 15 " micaceous sandy shales above, argillaceous shales with bands of nodules below                            | 671-656 |
| (3). | 1 foot black indurated thin splitting shale....                                                               | 656-655 |
| (4). | 5 " coal.....                                                                                                 | 655-650 |
| (5). | 2 " limestone.....                                                                                            | 650-648 |

Numbers 4 and 5 in this section are the equivalents of 3 and 4 in the previous section. The same succession is seen south of Mineral, where Mr. W. H. Forrest has sunk a shaft and observed the following section:

#### MINERAL.

A. T.

- |      |                               |         |
|------|-------------------------------|---------|
| (1). | 12 feet sandstone.....        | 709-697 |
| (2). | 18 " light colored shale..... | 697-679 |
| (3). | 6 " bituminous shale.....     | 679-673 |
| (4). | 5 " coal.....                 | 673-668 |
| (5). | 1 foot fire clay.....         | 668-667 |
| (6). | Limestone.....                | _____   |

The beds which are found under the limestone of these sections are not exposed anywhere along the line of the survey, except in the vicinity of LaSalle, but from borings which have been made in various places in Bureau and LaSalle counties they are known to consist of alternations of shales and sandstone, with seams of coal and limestone. In a well which was bored about a mile and

one-half southeast of Annawan, on Mr. L. A. Ferguson's farm, strata below this horizon were passed through as follows:

#### ANNAWAN.

	A. T.
(1). Drift .....	_____
(2). 6 feet miner's "slate" .....	557-551
(3). 3 " coal .....	551-548
(4). 1 foot fireclay .....	548-547
(5). 10 feet shale .....	547-537
(6). seam of limestone .....	_____
(7). 16 " sandy shales .....	537-521

At Atkinson coal is mined at a small depth, from a seam which is probably identical with number 3 in the section of Ferguson's well. In Mr. Riley's mine, south of the city, the succession of the beds is as follows:

#### MR. RILEY'S SHAFT, ATKINSON.

	A. T.
(1). Drift .....	_____
(2). 4 feet shale .....	648-644
(3). 1 foot concretionary limestone .....	644-643
(4). 15 feet shale .....	643-628
(5). 1 foot limestone .....	628-627
(6). 2 feet shale .....	627-625
(7). 3 " miner's "slate" .....	625-622
(8). 3 " coal .....	622-619
(9). Fire clay .....	_____

The same is seen in a shaft on Mr. James Kay's farm, four miles west of the city.

#### MR. KAY'S SHAFT, ATKINSON.

	A. T.
(1). Drift .....	_____
(2). 1 foot limestone .....	642-641
(3). 17 feet shale .....	641-624
(4). 2 " miner's "slate" .....	624-622
(5). 3 " coal .....	622-619

Mr. John Mowbray some years ago explored below this coal not far from Mr. Kay's place and found the following beds below it:

MR. MOWBRAY'S SHAFT, ATKINSON.

	A. T.
(1). 4 feet pyritiferous fire clay.....	619-615
(2). 2 " concretionary limestone.....	615-613
(3). 12 " blue shale.....	613-601
(4). 2 " sandstone.....	601-599
(5). 1 foot coal.....	599-598
(6). 4 feet fine fire clay.....	598-594
(7). Impure fire clay.....	————

The lower part of the coal measures contain a greater percentage of arenaceous material. This is first seen at Geneseo.

SECTION IN GENESEO CREEK.

	A. T.
(1). Concretionary . . . . .	————
(2). Sandstone (partly concealed) . . . . .	————
(3). 2 feet black shale . . . . .	623-621
(4). 1 foot coal and shale . . . . .	621-620
(5). 3 feet fire clay . . . . .	620-617

It is also seen in the ravines back of Carbon Cliff.

SECTION OF ARGILLO WORKS CLAY PIT.

	A. T.
(1). Drift . . . . .	————
(2). 10 feet sandstone . . . . .	645-635
(3). 1 foot coal . . . . .	635-634
(4). 4 feet fire clay . . . . .	634-630
(5). 25 " shale . . . . .	630-605

In Heagey's mine, south of Port Byron Junction, the succession is as follows:

HEAGEY'S MINE, PORT BYRON JUNCTION.

	A. T.
(1). 50 feet drift . . . . .	684-634
(2). 14 " sandstone and "cap rock" . . . . .	634-620
(3). 3 " coal . . . . .	620-617

Donald and Jamison's shaft, about a mile southwest of this place, was sunk through the following strata:

## DONALD AND JAMISON'S SHAFT.

	A. T.
(1). Drift .....	-----
(2). 15 feet sandstone.....	630-615
(3). 8 " dark shale.....	615-607
(4). 2 " coal ("bone coal").....	607-605
(5). 4 " fire clay.....	605-601
(6). Not reported.....	601-590
(7). Coal.....	-----

The arenaceous character of the lower part of the coal measures is, however, best developed east of Ottawa. At Marseilles and Seneca there is a sandstone over 50 feet thick, and in the vicinity of Morris the exposures of the coal measures along the canal mostly consist of sandstone. This is the equivalent of the famous fossil bearing sandstone of Mazon creek.

The character of the material constituting the base of the coal measures is quite varied. Most commonly it consists of sandstone. This is the case farthest east in the DuPage river south of Channahon in the Kankakee river above its mouth, and in Au Sable creek, east of Morris. West of Morris the lowermost of the coal measures are composed of shale overlying a seam of coal, as seen in the following sections:

## PRENDERGAST AND M'CLARY SHAFT, SENECA.

	A. T.
(1). Alluvium.....	-----
(2). 20 feet sandstone....	502-482
(3). 8 " "soapstone".....	482-474
(4). 2 " hard black shale.....	474-472
(5). 10 " sandstone.....	472-462
(6). 63 " "soapstone".....	462-399
(7). 3 " coal.....	399-396

CARNEY BROTHERS' SHAFT,  $\frac{1}{2}$  MILE EAST OF MARSEILLES.

	A. T.
(1). Drift.....	—
(2). 4 feet coal.....	551-547
(3). 57 " sandy shales and sandstones.....	547-490
(4). 1 foot black miner's slate. ....	490-489
(5). 69 feet shales.....	489-420
(6). 3 " coal.....	420-417

## RIVER BLUFF, MARSEILLES.

	A. T.
(1). Drift.....	—
(2). 60 feet sandstone.....	580-520
(3). 5 " dark shale.....	520-515

West of Ottawa, the coal measures may be said to begin with a seam of coal resting on the St. Peter sandstone. At Split Rock they consist, as already noted, of brecciated fragmentary material. In the vicinity of Bureau Junction, where a number of borings have been made, some of the drillers have reported "zinc ore" from the horizon under consideration, but as no competent analyst has examined the material, so far as known, nothing definite can be stated as to the nature of the borings so named.

At Annawan the lowest strata of the coal measures run as follows:

## SECTION OF ANNAWAN CREAMERY WELL.

	A. T.
(1). 124 feet drift.....	629-505
(2). 14 feet dark shale.....	505-491
(3). 1 foot bituminous seam.....	491-490
(4). 21 feet shale... ..	490-469
(5). 1 foot limestone.....	469-468
(6). 1 " coal.....	468-467
(7). 1 foot fire clay.....	467-466
(8). Niagara Limestone.....	—

On the lowlands along Green river coal has been stripped from the top of the Devonian limestone, and this coal was capped by a black bituminous limestone, but some distance to the west of this place a sandstone is found occupying the position of this coal. Along the Mississippi river, near Port Byron Junction, the little remnant left of the coal measures consists of sandstone, in which pebbles are occasionally found imbedded.

In the city of Rock Island an outlier of Devonian limestone is capped by a small remnant of a hard conglomerate, which consists for the greater part of chunks of yellow chert containing Silurian fossils. Though positive proofs are wanting, there are good reasons to believe that this conglomerate belongs to the coal measures.

#### **A Marked Unconformity.**

The coal measures are separated from the rocks below them by a marked unconformity. For the greater part of the distance across the State it appears as an unconformity without tilting. At Rock Island it displays erosion forms in the underlying horizontal strata, with reliefs of nearly 70 feet, and the lower rocks are studded with caves which are filled with sandstones and shales of the coal measures. Similar appearances have already been referred to above as occurring near East Moline and at Carbon Cliff. In nearly all of these localities the underlying limestone is studded with caves which are filled with sandstones and shales belonging to the coal period. South of Channahon, on the bank of the Du Page river, eroded depressions in the Niagara and the Cincinnati formations were observed to be filled with coal measure sandstones, in which were found, with imperfectly preserved woody tissue of plants of the coal age, various fragmentary materials of the underlying

rock, such as lumps of the Cincinnati shale and small blocks of Niagara limestone, containing casts of the fossils of that age.

At LaSalle it appears as an unconformity produced by tilting with a differential precarboniferous erosion of 900 feet, this thickness having been removed (in excess of the denudation on the west side) from the underlying rocks on the east side of the monocline at this place. In its general aspect, the unconformity may be said to be connected with a general tilting of the subjacent formations, for these are seen to slowly ascend and run out under the superimposed coal measures, both in the east and in the west end of the section.

### **The Rocks of the Devonian Age.**

To recapitulate what is already stated in the description of the superficial features, the exposed Devonian rocks may be given as follows:

#### **SECTION NEAR ROCK ISLAND DEPOT.**

A. T.

- |      |    |                                                                                                                                        |         |
|------|----|----------------------------------------------------------------------------------------------------------------------------------------|---------|
| (1). | 20 | feet shaly limestone and calcareous shale, containing throughout fossil brachiopods, and near the top stems of various crinoids.. .. . | 599-579 |
| (2). | 6  | " composed of three ledges of limestone separated by seams of shale, and containing about the same fossils as the beds above.....      | 579-573 |
| (3). | 7  | " consisting of three solid ledges of a strong limestone, containing a less number of brachiopods and more corals.....                 | 573-566 |
| (4). | 5  | " even grained, sometimes brecciated, limestone, containing no fossils.....                                                            | 566-561 |

Below this there are probably some 70 or 80 feet of limestone, like No. 4 of the above section, but though

there are quite a number of exposures of this limestone, no continuous section can be constructed for this locality. On Sylvan Island, just north of Moline, there is a typical exposure of these lower beds which may be described as follows:

SWAN TROPP'S QUARRY, ON SYLVAN ISLAND.

A. T.

- (1). 7 feet irregularly bedded white and hard limestone, but little brecciated and weathering into thin layers..... 577-570
- (2). 5 " darkish compact limestone, with a peculiar lamination, occasionally presenting a low dome-shaped structure..... 570-565
- (3). 1 foot pure and white, massive limestone..... 565-564
- (4). 4 feet dark limestone, resembling No. 2..... 564-560
- (5). 3 " white limestone, sometimes massive, and sometimes brecciated and composed of good-sized blocks of dark material imbedded in the white ..... 560-557

From borings made at Rock Island it seems as if there were 40 feet or more of similar rocks below this section.

Materials resembling these rocks are reported from the boring at Geneseo, but nothing can be said with certainty as to the occurrence of Devonian rocks at this place. In the boring at Annawan they are, without a doubt, absent, but in several borings in Bureau creek valley and in the artesian well at Hennepin, as well as in the wells at Peru and LaSalle, calcareous shaly beds were encountered on top of the Silurian limestone, which in all probability belong to this age; but here again positive knowledge from fossils is wanting. The thickness of these undetermined shales averages 100 feet.

## THICKNESS AND POSITION OF DEVONIAN ROCKS.

(Estimated from borings).

		A. T.
Rock Island, shales and limestone ...	80 feet.	599 —519
Moline, limestone.....	50 "	565 —515
Carbon Cliff, limestone.....	80 "	580 —500
Searles' Well, limestone.....	(?) 40 "	560 —520
Geneseo, limestone.....	(?) 40 "	520 —480
Princeton, shales and limestone.....	(?) 100 "	120 —20
Hennepin, shales and limestone.....	(?) 100 "	130 —30
LaSalle, shales.....	(?) 130 "	0 —130

**The Contact Between the Devonian and the Silurian Systems.**

The contact between the Devonian and the Silurian rocks is not exposed for certain anywhere in Rock Island county. About one-half mile below Hampton there is seen in the bank of the Mississippi some buff-colored limestone, which Professor Worthen refers to as the southernmost exposure of the Niagara limestone along the river in this county. (Geol. Surv. of Ill., vol. V., p. 223.) There is no doubt that the top of the Niagara limestone comes near to the surface at this place, for it soon appears in the river above Hampton. But on a closer examination of the rocks at this point they show a greater resemblance to the lowest unfossiliferous layers of the Devonian rocks than to the uppermost of the Silurian strata. The color is the same as that of the latter, but this color is due to weathering of an originally bluish-white limestone, like the Devonian in texture, as can be seen on a freshly broken surface of some of the ledges. It may be that the rocks seen farthest to the north at this place belong to the Silurian system. If such is the case, we have here the contact between the two systems. Nothing is exhibited in distinctness. The beds are all apparently horizontal. But there are found in the limestone broken pieces of

chert, which have a decided appearance of being transported fragments rather than concretions formed in situ. This is the only evidence of an unconformity between the two systems at this place.

If the undetermined shales under the coal measures at Peru and LaSalle belong to the Devonian age, it would seem that we have at this place another evidence of an interval of erosion at this horizon. In the well bored by the Illinois Zinc Company the thickness of the Niagara limestone is considerably less than in the wells farther west. This may be best explained as being due to erosion previous to the deposition of the shales supposed to belong to the Devonian age.

### **The Silurian System.**

*The Niagara Limestone.* The Niagara limestone forms the uppermost member in this system. Its thickness in the west part of the State is only known from borings, and is found to vary from 275 feet to 400 feet, averaging 350 feet. The upper part seen on the Mississippi and on Rock river is yellowish and hard, but rendered somewhat porous by the removal of imbedded corals and stems of crinoids, the empty moulds of which remain. It is seen to have an oblique and variable bedding, which persists across the State, being well exhibited in the exposures northwest of Manhattan in Will county. Drill cores taken below the coal measures from Mr. Weise's well in the Bureau valley were from rock belonging to this horizon. The lower part of the Niagara formation consists of a bluish white, compact, and evenly bedded limestone which contains, especially in the upper part, bands of gray and white chert. It was identified in drillings from the creamery well at Annawan.

THICKNESS AND POSITION OF THE NIAGARA LIMESTONE.  
(Estimated from borings).

		A. T.
Rock Island.....	364 feet.	519-155
Moline .....	349 "	515-166
Carbon Cliff.....	388 "	500-112
Searles' Well.....	370 "	520-150
Geneseo.....	383 "	480-97
Annawan (eroded).....	(?)300 "	466-(?)166
Princeton .....	335 "	20 —315
Hennepin .....	350 "	30 —320
LaSalle (probably eroded).....	234 "	130 —364
Joliet (eroded).....	230 "	540-310
Chicago (eroded).....	254 "	530-276

*The Cincinnati Formation.* The Cincinnati formation, which underlies the Niagara, varies in thickness, as reported by drillers, from 68 to 250 feet. The exposures in the vicinity of the headwaters of the Illinois river are too much scattered for correlation into a continuous section, but in a series of borings taken with more than ordinary care, by Mr. W. Moore, from the artesian well at the Illinois Zinc Company's Works at LaSalle, the following succession was seen:

	A. T.
(1). 16 feet blue shale, occasionally stained with iron.....	—364 —380
(2). 5 " light blue shale.....	—380 —335
(3). 25 " blue shale.....	—335 —410
(4). 5 " gray crystalline limestone.....	—410 —415
(5). 25 " hard brownish limestone.....	—415 —440
(6). 10 " blue shale.....	—440 —459
(7). 11 " gray limestone.....	—459 —470
(8). 5 " bluish limestone.....	—470 —475
(9). 8 " brownish limestone.....	—475 —483
(10). 18 " dirty brown limestone.....	—483 —501
(11). 12 " shale and limestone.....	—501 —513
(12). 29 " lighter limestone and shale.....	—513 —542

Number 4 in the above section resembles a limestone belonging to the Cincinnati, which is seen around Goose Lake in Grundy county. It is there crystalline and may almost be called a marble.

#### THICKNESS AND POSITION OF THE CINCINNATI FORMATION.

(Estimated from borings).

		A. T.
Rock Island, shale.....	200 feet.	155 —45
Moline, shale.....	213 "	166 —47
Carbon Cliff, shale.....	180 "	112 —68
Searles' Well, shale, sandy grit below..	75+ "	150-(?)
Geneseo, shale.....	95 "	97-2
Princeton, shale with limestone near middle .....	175 "	315 —490
LaSalle, shale, with two bands of limestone near middle .....	138 "	364 —502
Morris' Driving Park, white shale (eroded?) .....	70 "	430-360
Blodget, bituminous, calcareous shale.	75 "	505-430
Joliet, shale.....	68 "	310-242
Chicago, shale, with limestone near middle .....	250 "	276-26

*The Trenton Limestone.* The Trenton limestone, which follows in downward succession, is quite uniform in its development, averaging 350 feet in thickness and varying less than 70 feet either way. In its upper part it is hard and slightly crystalline and white or brownish in color, while below it is bluish and massive, sometimes slightly brecciated and occasionally containing fine sand. The only exposures along the section have already been noticed.

## THICKNESS AND POSITION OF THE TRENTON LIMESTONE.

(Estimated from borings).

		A. T.
Rock Island.....	440 feet.	—45 —485
Moline .....	320 "	—47 —367
Carbon Cliff (not bored through).....	241+ "	—68-(?)
Searles' Well, (exact limits unknown, at least.....)	250 "	— —
Geneseo.....	430 "	2 —428
Princeton .....	410 "	—490 —900
LaSalle.....	405 "	—502 —907
Marseilles (eroded), a few feet at.....	—	410
(?)Pedicord's Well (eroded), perhaps 20 feet at.....	—	390
Seneca (eroded).....	120 "	400—280
Hoge's Well (eroded?) .....	200 "	480—280
Morris' Driving Park (eroded?) .....	170 "	360—190
Blodget .....	300 "	430—130
Joliet .....	333 "	242 —91

*The St. Peter Sandstone.* Below the Trenton formation lies the St. Peter sandstone, ranging from 140 to 240 feet in thickness and averaging 200 feet. It is white, friable, pure, siliceous sandstone, remarkably uniform in its lithological character across the whole State, generally accompanied by a few feet of shale above and below, and in the borings at Rock Island, Moline and Geneseo, in the west part of the State, it has been found to contain a shaly stratum in its middle part.

## THICKNESS AND POSITION OF THE ST. PETER SANDSTONE.

(Estimated from borings).

		A. T.
Rock Island .....	145 to 200 feet.	—465 —610
Moline .....	200 “	—367 —567
Searles' Well (thickness unknown)...	(?) “	—315-(?)
Geneseo .....	220 “	—428 —648
Princeton .....	160 “	—900 —1060
LaSalle (shaly below at San Bede College).....	(?)175 “	—907 —1082
Utica (exposed in bluff and eroded)..	40 “	522-482
Ottawa (partly exposed and eroded)..	130 “	483-345
Marseilles .....	(?)200 “	(?)-(?)
Peddicord's Well .....	275 “	350-75
Seneca .....	(?)220 “	(?)250-30
Hoge's Well .....	268 “	274-6
Morris' Driving Park Well .....	(?) “	180-(?)
Minooka .....	(?) “	(?)82-(?)
Joliet .....	211 “	—91 —302

*The Magnesian Limestone.* The Magnesian limestone is the lowermost formation exposed in the State. It is an impure, somewhat thin-bedded limestone, with many seams of siliceous sand distributed through its entire thickness, and sometimes with sand distributed through the mass of the limestone. In the exposures between Utica and LaSalle it often contains concretions of a peculiar texture, which show siliceous sand grains imbedded in a siliceous matrix, which evidently is a result of infiltration. In many of the thin seams of clay, which separate the limestone layers, there are marks of sun-cracks, and in the mines of the Utica Cement Works there are disclosed ripple marks of an unusual size measuring by estimate 2 feet from crest to crest of the waves.

Westward from Joliet a bed of sand 100 feet in thickness is developed in its upper part, and at Geneseo the upper half of the formation has by the drillers been reported as sandstone. Going from east to west the

formation increases in thickness, and at Rock Island it is reported by Professor J. H. Southwell as having a thickness of 811 feet.

*The Potsdam Series.* The greater part of the Magnesian limestone and all of the Potsdam series, being known in the State only from borings, the proper boundary between the two are of course somewhat uncertain. If we make it at the point where the sandy, light limestones are succeeded by shales and sandstones, with occasional less heavy deposits of limestone, the formation, as far as explored, may be said to consist of two sandstones separated by an intervening shale.

There is a noticeable correspondence in the strata reported by the drillers from the deepest wells along the east end of the section, and a strong flow of water has been uniformly met with in a sandstone which occurs at a depth of from 1700 to 2300 feet. Of course it is quite possible that the correspondence in the strata is accidental and that the "Potsdam sandstone" of the drillers belongs to an underlying series which may be unformable to the Potsdam.

#### **The Structural Features of the Section.**

These are of the simplest kind and may be regarded as typical of the structure found in the upper Mississippi valley. We see two blocks of horizontal or only very slightly inclined strata separated by a monoclinial fold. The downthrow and the trough limb is on the west, while the upthrow and the arch limb is on the east. The total displacement of the Silurian strata amounts to 1,575 feet, while the carboniferous beds are only displaced about 625 feet. The trend of the axis of disturbance is considerably west of north, the strike of the outcrops of the upturned coal measures being about N. 30 W. The average dip in the displacement at LaSalle is about

22° for the Silurian rocks and about 8° for the rocks of the coal measures. The block of strata west of the monocline is nearly horizontal in an east to west direction from Rock Island to Annawan and from Princeton to LaSalle, but between Annawan and Princeton there is a dip to the east of about 25 feet to the mile, or there is a concealed displacement of that extent between these two places. This dip may be partly accounted for by the dip to the south, which is found along the whole section. The block of strata on the east of the monocline has a nearly uniform dip to the east of about 12 feet to the mile.

#### **Some Points Bearing on the Geological History of the Northern Part of Illinois.**

It would be idle to speculate much on the physical geography of this part of the State at the time of the deposition of the lowest series of rocks exhibited in the section.

From the nature of the strata we may suppose that during the age following the Potsdam period there was a subsidence, during which the Magnesian limestones were deposited, following this an elevation causing the accumulation of the St. Peter sandstone, again a subsidence during the formation of the Trenton limestone, then again a slight elevation during the Cincinnati period, followed by a subsidence during the Niagara period. This was brought to a close by an elevation, which first caused irregularities in the bedding of the calcareous sediments, and finally raised the top of the lowest sediments above the surface of the water, but probably did not expose them to any extensive erosion.

When these lands again subsided the limestones and shales of the Devonian age began to accumulate on top of the perhaps but slightly eroded Silurian rocks. The

comparative length of the duration of these conditions cannot be estimated, for this was succeeded by an elevation which not only affected northern Illinois but the northern part of all of the Mississippi valley and continued for a time long enough for the removal of several hundreds of feet of the early rocks and for the formation of all the rocks belonging to the sub-carboniferous limestone in the southern part of this State. During this period of elevation there commenced at Split Rock a tilting of all previously deposited rocks. The east side was lifted up and the west side was depressed. As a consequence erosion proceeded much faster on the elevated side than on the side where the beds were being lowered, or at any rate, were raised less. By the end of this period of elevation 900 feet of rock were removed from the summit of the incline at Split Rock, which, as yet, remained intact west of La-Salle. Eastward from Split Rock the denudation was also gradually less effective, presumably on account of the lesser elevation. Thus we find all of the Trenton limestone removed as far as Marseilles and all of the Cincinnati shales carried away west of Morris, and nothing remaining of the Niagara limestone west of the junction of the DesPlaines and the Kankakee rivers, while from Manhattan to Indiana this formation suffered no more erosion than it did in the vicinity of Rock Island. Assuming that the land contours produced at the end of this interval of elevation were as uniform as those of the present, the tilting was equal to the difference of erosion, or 900 feet, and the dip of the inclined strata at Split Rock, which now averages  $22^{\circ}$ , may be supposed to have been at that time considerably less.

Then again followed a subsidence of the land, with the possible exception of that in the eastern part of the State. This time, however, the subsidence was not as

deep as during the previous ages, nor as extensive in a northerly direction, for we find the coal measures everywhere containing remains of plants, sometimes grown near the place where they are found. The land was kept slowly oscillating, mostly below the surface of the water, and seldom reaching a depth great enough for the accumulation of limestone. The duration of the eperiod of formation of coal in northern-central Illinois, though certainly not as long as the time which was taken for the deposition of Silurian strata, cannot be closely estimated on account of the lack of knowledge of the extent to which the coal measures have been afterwards eroded. The 500 feet of strata yet remaining were, no doubt, formed in a considerably shorter time than an equal thickness of the older beds, for the reason that the coal measures were formed nearer the land, where sedimentation is more rapid than it is farther out in the open sea, where the Silurian and the Devonian strata were mostly formed.

No rocks of the Mesozoic or the Tertiary ages have been observed, and there is little doubt that, since the time of the coal period, northern Illinois has been above water and subjected to continual erosion. The extent of this erosion is partly concealed by the glacial deposits. Borings in the Bureau valley and at Hennepin show that before the incursion of the ice there was at this place a drainage channel cut nearly 200 feet below the present level of the Illinois river, and bounded by slopes which rose to a height of 300 feet and over. The comparatively greater depth of the drift in the valleys crossing our section west of Atkinson and west of Anawan and close to Mineral as well as the northward slope of the surface of the bed-rock all along the section from Rock Island to the Illinois river, and the deeply drift-covered lowlands to the north, indicate a west-

ward extension of this drainage channel. The long-continued denudation of which these deep reliefs were, no doubt, a result, was checked by the advance of an ice-field, which extended several hundred miles to the south. This ice-sheet itself, to some extent, planed down the land over which it crept, but in this region the quantity of boulder clay and sand which it deposited far exceeded the material it removed. The occurrence of forest beds and several moraines indicate different stages of advancements and recessions, if not total disappearance of the ice, until it finally left the land in its present appearance, minus the drainage channels of creeks and rivers, which have, for the most part, afterward been carved into the drift.

#### **Artesian Water.**

The universal dip from the north, where the elevation of the surface of the land is higher, renders the conditions for obtaining artesian water generally favorable in this part of the State, and a number of flowing deep wells have been made. Theoretically all rocks below the level of complete saturation are water-bearing and will yield water, but practically we find that water is supplied in quantities that can be utilized only by rocks which are somewhat porous, as sandstones and porous limestones. In northern Illinois there are a number of horizons which are porous enough to yield water. Many of these are only local in their development, and the supply is in such case limited. Other porous rocks extend over wide areas and are readily supplied with great quantities of water. In the wells, from which the lower part of the section was constructed, the various water-bearing rocks which have been encountered are as follows:

- (1). The drift.
- (2). The base of coal measures.
- (3). The Niagara limestone.
- (4). The Trenton limestones.
- (5). The St. Peter sandstones.
- (6). The sands of the Magnesian series.
- (7). The Potsdam sandstone.

### **The Drift and the Base of the Coal Measures.**

The artesian water, which is found in the drift, is always limited to particular localities. Some of the borings north of Bureau Junction have yielded flowing water, which has come from sandy layers in the drift. At Bureau Junction and at Hennepin a flow of water has been reported from a depth which coincides with the lower part of the coal measures. The flow was small and of little economical importance. It is a mineral water,

### **The Niagara Limestone.**

The upper part of the Niagara formation furnishes a strong flow of water at Peru and LaSalle. The Hennepin well also taps the Niagara. This formation furnished a small flow in Mitchell & Lynde's well, at Rock Island, and gives the chief flow in Mr. Wiese's well north of Bureau Junction. The water is more or less salty to the taste, and at Peru it is a strong brine. The head of this water, as near as can be made out, is as follows:

#### **HEAD OF NIAGARA WATER.**

(Of course this head is local).

	A. T.
Rock Island .....	560 feet
Wiese's well .....	535 "
Peru.....	563 "

### The Trenton Limestone.

A little below the middle of the Trenton limestone there has been found water in nearly all the wells going through this rock. The yield is generally not very great, and the pressure, lower than that of the St. Peter water, with which it otherwise seems to be connected. It contains a large amount of sulphur gas, and has in some places been piped off on account of its disagreeable smell. The height to which it will rise is mostly a little below 575 feet west of LaSalle, and not much above 515 along the east part of the section.

### The St. Peter Sandstone.

The St. Peter sandstone is tapped by more wells in the State than any other formation. Its water is less sulphurous than the Trenton water, and along the east part of the section it contains more iron. The quantity of water is large. The head averages at least 580 feet in the west part of the section. Near the outcrops of the formation it is much lower, rising again to the east, viz.:

#### HEAD OF ST. PETER WATER.

	A. T.
Rock Island.....	580 feet.
Peru.....	592 "
Illinois Zinc Company.....	571 "
Ottawa.....	540 "
Hoge's well.....	580 "
Cryder Collin's well.....	580 "
Wilmington.....	586 "

### The Magnesian Sands.

In the east part of LaSalle county, in Grundy county, and in the west part of Will county the sandstones of the Magnesian series are bored into whenever the flow of the St. Peter sandstone is not found sufficiently strong.

Between Utica and Marseilles nearly all bored wells take their supply from these sands and at Ottawa there are over 100 wells that draw their supply from them. They probably also furnish some of the water in the Princeton well. It is the purest of all our artesian waters, containing only a small amount of soluble salts. The head is generally some 30 or 40 feet above that of the St. Peter water, being at Ottawa about 573 feet.

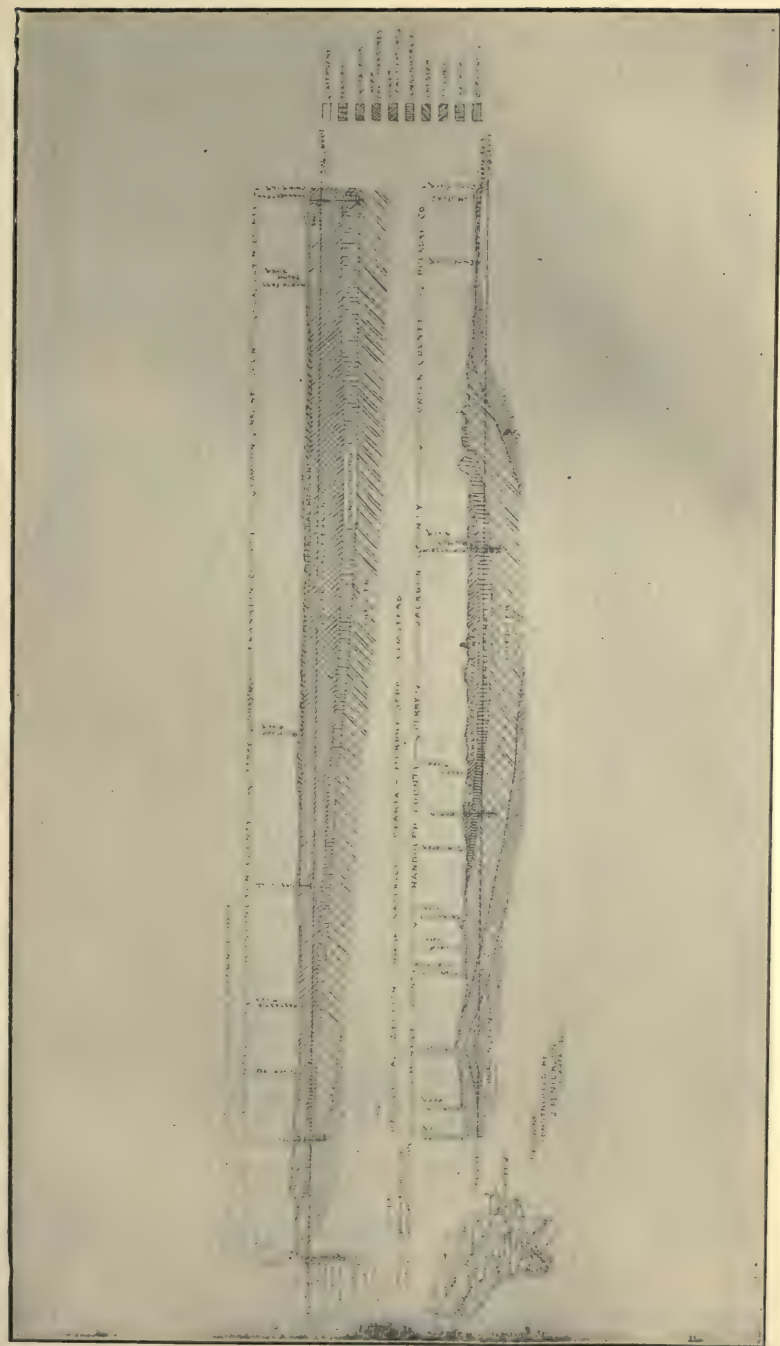
### The Potsdam.

The water which will rise highest,—since the rock in which it occurs has the highest outcrop,—is the water of the Potsdam sandstone. The rock has a good supply of a somewhat salty water. The saltiness increases with the depth, and it is sometimes difficult to procure a good, large flow without going down so deep as to make the water too salty for general use. If the upper flows are properly piped off, the head is a trifle above 700 feet, as seen below.

#### HEAD OF POTSDAM WATER.

	A. T.
Geneseo (no casing).....	670 feet.
Minooka (no casing).....	660 “
Catlin's well (Ottawa).....	705 “





A GEOLOGICAL SECTION ACROSS SOUTHERN ILLINOIS.



## GEOLOGICAL SECTION—ST. LOUIS TO SHAWNEETOWN.

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BY PROF. J. M. NICKLES.

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### Introductory.

THE field work for this section was carried on during July and August, 1892. The limited time and small number of exposures of strata and the considerable intervals by which these exposures were commonly separated made it impossible to ascertain the exact position of each particular outcrop in the vertical series or determine the relations of the various outcrops to one another. This difficulty is increased by the striking sameness in material composing the deposits of the Coal Measures Series in southern Illinois; sandy shales, sometimes shading off into sandstone, at other times into clay shales, being predominant, and limestones few and infrequent. Fossils are rare or wanting at all but a few horizons, though in some beds and in some localities abundant. But from the general likeness of the strata and the uniformity in deposition and character of material, with the preliminary work done years ago by the Geological Survey, under the direction of Prof. A. H. Worthen, of which I have freely availed myself, it has been comparatively easy to decide to which of the main divisions of the Coal Measures to assign the various outcrops.

For the surface contour I am indebted to Prof. J. W. Rolfe, of the University of Illinois, who kindly sent me tracings from the topographical county maps, prepared

under his direction from the survey undertaken to prepare the topographical map of the State, which formed part of the Illinois exhibit at the World's Fair.

The diagrams of the sections which are given on the accompanying plate are reproduced, on a smaller scale, from those displayed in the geological department of the Illinois exhibit. Some of the data contained in the following pages are shown in the diagrams, but the greater part are precluded from appearing by the necessarily small scale of the diagrams.

The line of the sections extends in a southeast-by-east direction from St. Louis, on the Mississippi river, to Shawneetown, on the Ohio river. The line passes diagonally through the center of St. Clair county, a little southwest of the center of Washington county, intersects the northeast corner of Perry county, southwest part of Jefferson county, the northern part of Franklin county, the southwest corner of Hamilton county, northeast corner of Saline county, and the center of Gallatin county.

All the strata outcropping on the line or in its immediate vicinity belong to the Carboniferous Series and the Coal Measures Division. During the reconnaissance, search was made for exposures, and, whenever found, measurements of the thickness of the outcropping strata were made, and specimens of the different strata collected. The sections thus made and other data accumulated, logs of coal shafts and drill holes, are given in the following pages, to show the data from which the diagram sections were constructed.

But few exposures are found in the vicinity of the line, owing to the comparatively small variation in altitude of the surface, and to the entire region being covered with a sheet of Quaternary deposits, clay, gravel, or loess, to the depth of from 10 to 150 feet,

and also to the general softness of the strata, so that even along the streams but few outcrops are seen, and these of limited extent. It is as Mr. Engelmann justly said, in describing the geology of Washington county: "In conformity with the predominating prairie character and on account of the softness of most of the strata, outcrops of rocks are quite scarce, and rocky cliffs are only developed on a small scale."

The section is begun with the Belcher well at St. Louis, the record of which will be found in the "Transactions of the St. Louis Academy of Science" (Vol. I., pp. 80-86, 1857). East of the Mississippi river the line of the section crosses first the flood plain of the Mississippi, known as the American bottom, for a distance of about seven miles, in which there are no exposures. The first outcrops are found in the bluffs which rise to a height of from 120 to 200 feet above the plain at their foot; at the time of my examination the bluffs were so overgrown with vegetation that the strata could be seen in but few places.

### St. Clair County.

#### GEOLOGICAL FORMATIONS.

(GEOL. SUR. ILL. I., 298.)

Quaternary, marl, clay, sand, gravel, etc.....	20-150 feet.
Lower coal measures, including the conglomerate, about	300 "
Subcarboniferous or Mississippian series, comprising	
the Chester and St. Louis subdivisions, about.....	300 "

#### SECTION I.

Outcrop in Mississippi river bluff, seven miles northwest of Belleville, on the northwest quarter of section 35, town-

ship 2 north, range 9 west. Top of section is about 500 feet above sea level.

1. Shale, blue, argillaceous, exposed.....	8 feet.	
2. Shale, yellow, argillaceous.....	6 "	
3. Limestone, in part nodular with conchoidal fracture.....	1 foot.	
4. Shale, blue, argillaceous, like No. 1.....	2 feet.	
5. Limestone, like No. 3.....	3 "	
6. Shale, bituminous, slaty.....	—	3 inches.
7. Coal No. 6, "Belleville Coal".....	5 feet.	
Total thickness seen.....	25 "	3 "

## SECTION II.

Outcrop in bluff at Strowbinger's coal mine, about one-fourth mile southwest of preceding section. Top of section about 490 feet above sea level.

1. Limestone.....	3 feet.	
2. Shale, bituminous, slaty.....	3 "	
3. Coal No. 6.....	7-8 "	
4. Fire-clay, from 1 foot 6 inches to.....	4 "	
5. Limestone, exposed.....	2 "	
Total thickness seen.....	20 "	

## SECTION III.

Section in Chris. Lauf's stone quarry on bank of Richland creek, and coal shaft below quarry in Belleville. Top of section is about 510 feet above sea level.

1. Clay, loess, quarried for the manufacture of brick, tile, etc.....	15-25 feet.	
2. Limestone, brownish, fossiliferous.....	3 "	6 inches.
3. Fire-clay.....	7 "	
4. Limestone, granular, fossils, few, indistinct.....	6 "	
5. Limestone, fine-grained, bluish, bottom of quarry.....	6 "	
6. Limestone, one eight feet ledge, several two feet ledges.....	21 "	
7. Shale, bituminous, the "slate" of the miners.....	2 "	
8. Coal No. 6, "Belleville Coal".....	7 "	
Total thickness.....	77 feet	6 inches.

## SECTION IV.

Record of a well bored at Belleville, near the northwest corner of section 3, township 1 north, range 8 west, in 1889, taken from the Belleville News-Democrat of March 8, 1889. Top of well is about 530 feet above sea level.

1. Soil and clay.....	26 feet.
2. Sand and gravel.....	2 "
3. Yellow clay.....	34 "
4. Limestone.....	58 "
5. Coal (No. 6).....	7 "
6. Fire clay.....	2 "
7. Shale and sandstone.....	169 "
8. Gray sandstone.....	14 "
9. Black shale.....	3 "
10. Sandstone, white.....	10 "
11. Clay shale.....	8 "
12. Sandstone, reddish.....	47 "
13. Sandstone, white.....	10 "
14. Sandstone, gray.....	12 "
15. Shale.....	27 "
16. Sandstone, soft.....	14 "
17. Sandstone, hard.....	15 "
18. Sandstone, gray.....	58 "
19. Sandstone, dark.....	21 "
20. Limestone.....	25 "
21. Sandstone, brown.....	19 "
22. Limestone.....	13 "
23. Sandstone.....	16 "
24. Limestone, hard.....	21 "
25. Shale.....	100 "
26. Limestone.....	93 "
27. Shale.....	86 "
28. Sandstone.....	10 "
29. Conglomerate.....	30 "
30. Shale.....	56 "
31. Sandstone and shale.....	70 "
32. Shale, black.....	20 "
33. Sandstone and shale.....	25 "
34. Cherty rock.....	20 "

Total depth..... 1141 feet.

No 20, in the above, marks the uppermost limestone, or No. 1, of Worthen, of the Chester group. The dividing line between the lower coal measures and the conglomerate is not easily drawn; perhaps No. 12 above may be regarded as the top of the conglomerate; this gives the conglomerate a thickness of 204 feet. Perhaps this is too great a thickness, and it may be better to regard No. 17 as the top; this would make the conglomerate 94 feet thick.

No. 34 probably marks the summit of the St. Louis group. If so, the thickness of the Chester group, under St. Clair county, at this point, is 584 feet. Prof. A. H. Worthen (*Geol. Surv. Ill. I*, 305.) says: "This group (Chester), which is at least 600 feet thick in the southern part of Randolph county, has already thinned out, before reaching the southern part of St. Clair, to an aggregate of less than 100 feet, and includes only the lower sandstone and a thin bed of limestone, which probably represents also the lower limestone division in Randolph County."

The section above would indicate that the Chester group does not thin to the north as rapidly as has been supposed. If the interpretation given above is correct, and it seems the best explanation of the record, it goes to show that the study of surface exposures, few in number, without the knowledge given by the drill, is misleading; and illustrates how really small is our knowledge of the geology of Illinois, and enforces the necessity for a new geological survey of the State, or if not a new survey, then a continuous organization which shall accumulate and utilize the facts developed by the drill and other exploitation.

As correlated with the Chester group of Randolph county, the beds in the record above have their equivalents as follows:

- No. 20—Limestone No. 1.
- No. 21—Sandstone No. 1.
- No. 22—Limestone No. 2.
- No. 23—Sandstone No. 2.
- No. 24—Limestone No. 3.
- No. 25—Lyropora shale.
- Nos. 26 and 27—Limestone No. 4.
- Nos. 28 to 33—Basal sandstone, or Aux Vases sandstone, of the Chester group.

#### SECTION V.

Van Court's coal shaft, at O'Fallon, Ill. Top of shaft about 520 feet above sea level.

1. Soil .....	1 foot 6 inches.
2. Yellow clay .....	29 feet.
3. Yellow sandstone .....	16 "
4. Blue slate, mixed with sandstone.....	29 "
5. Blue slate, mixed with iron ore.....	35 "
6. Fire clay.....	4 "
7. Conglomerate.....	1 foot 6 inches.
8. Red shale and marl.....	4 feet.
9. Gray limestone.....	6 " 6 "
10. Clay shale.....	6 " 6 "
11. Sandstone .....	8 "
12. Bluish shale .....	4 " 6 "
13. Black-spotted limestone.....	6 " 6 "
14. Gray limestone.....	1 foot 6 "
15. Shale .....	46 feet 6 "
16. Coal .....	7 " 6 "

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Total depth.....207 feet 6 inches.

The coal, No. 16, in the above record, is undoubtedly Coal No. 6, or the "Belleville Coal." This would show that the shale above the coal, which is almost wanting in Section III, preceding, and is much thicker but inclu-

ded in No. 4, in Section IV, thickens very much eastwardly. At Belleville, Coal No. 6 is about 420 feet above the sea level, and at O'Fallon, about 320 feet above the sea level.

#### SECTION VI.

Shaft of the great Coal Pit at Summerfield, Ill. Top of shaft is about 500 feet above sea level.

1. Soil and clay.....	35 feet.	
2. Sandstone .....	3 "	6 inches.
3. Shale .....	11 "	
4. Sandstone .....	12 "	
5. Hard limestone.....	5 "	6 inches.
6. Sandstone .....	12 "	
7. Shales.....	81 "	
8. Conglomerate .....	4 "	
9. Gray shale.....	18 "	
10. Shale, blue, black, etc. . . . .	24 "	
11. Hard limestone.....	5 "	
12. Fire clay and black shale .....	25 "	
13. Clay, shale and sandstone.....	8 "	
14. Gray limestone.....	8 "	
15. Gray shale.....	19 "	4 inches.
16. Coal .....	4 "	8 "

Total depth..... 276 feet.

No. 5 (above) is the well marked horizon which has been called by various names in the geological reports of the State—Shoal creek limestone, Curlew limestone, Carlinville limestone—and is regarded as marking the boundary between the Lower and Upper Coal Measures.

No. 16 is coal No. 6. At Summerfield it lies about 230 feet above sea level; hence, in a distance of about nine miles from O'Fallon to Summerfield, the elevation of Coal No. 6 has declined ninety feet, about, or a fall of ten feet to the mile. This, however, is probably not the full amount of the dip, as the general dip of the strata is not directly to the east.

## SECTION VII.

Outcrops along Jack's Run, one-half mile east of Freeburg, on section 29, township 1 south, range 7 west.

1. Shale, arenaceous, exposed.....	6 feet.
2. Sandstone, soft, micaceous, massive layer.....	2-3 "
3. Sandstone, thinly stratified, in part shaly.....	15 "
4. Shale, argillaceous, greenish.....	5 "

Total thickness.....	29 feet.
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These strata lie some forty feet above the Belleville quarry rock, according to Worthen's report on St. Clair county, and correspond to Nos. 7-10 of Section VI, and Nos. 10-12 of Section V. A well was bored to the depth of 480 feet at Freeburg, some years ago, but investigation developed the fact that no record of the strata passed through had been preserved.

## SECTION VIII.

Boring at Lementon, on the Cairo Short Line (St. L., A. & T. H. R. R.), on section 8, township 2 south, range 7 west. (Geol. Sur. Ill., VII, 31). Surface about 460 feet above sea level.

1. Soil.....	3 feet.
2. Yellow clay.....	14 "
3. Sand and gravel.....	1 foot.
4. Blue clay.....	20 feet.
5. Carbonaceous clod.....	1 foot.
6. Clay shale.....	24 feet.
7. Rock (not defined).....	1 foot.
8. Clay shale.....	7 feet.
9. Black shale.....	9 " 6 inches.
10. Coal No. 5.....	1 foot 6 "
11. Fire clay and shale.....	34 feet.
12. Hard rock (limestone?).....	1 foot 6 inches.
13. Black shale.....	3 feet 6 "
14. Coal (No. 3, Worthen).....	0 " 2 "
15. Fire clay and shale.....	9 "

16. Brown shale.....	4 feet.
17. Black or blue shale.....	9 "
18. Hard blue shale.....	1 foot.
19. Sandstone .....	9 feet.
20. Brown shale.....	1 foot.
21. Sandstone .....	1 "
22. Coal (No. 2. Worthen).....	1 "
<hr/>	
Total depth.....	156 feet 2 inches.

## SECTION IX.

Boring from the bottom of coal shaft of White Oak Coal Co., near Marissa, Ill. (Geol. Sur. Ill., VII, 31).  
Top of shaft approximately 500 feet above sea level.

1. Strata above Coal No. 6.....	141 feet.
2. Coal No. 6.....	6 "
3. Fire clay.....	7 " 11 inches.
4. Limestone .....	2 " 10 "
5. Fire clay .....	1 foot.
6. Limestone.....	0 feet 11 inches.
7. Clay shale with iron ore concretions.....	50 " 10 "
8. Black shale.....	5 " 6 "
9. Clay shale.....	33 "
10. Blue shale, containing nodules.....	18 " 3 "
11. Limestone.....	1 foot 3 "
12. Black shale .....	6 feet.
13. Coal .....	1 foot 3 "
14. Fire clay and coal .....	2 feet 7 "
15. Fire clay.....	5 " 4 "
16. Coal .....	0 " 10 "
17. Fire clay.....	11 " 6 "
18. Variegated shale .....	1 foot 6 "
19. Sandy shale.....	8 feet 9 "
20. Dark limestone.....	0 " 3 "
21. Micaceous sandstone.....	15 " 6 "
22. Sandy shales with clay partings in lower part.....	50 " 1 "
<hr/>	
Total depth.....	372 feet 1 inch.

Nos. 13-16 of the above represent one of the lower seams, perhaps No. 3. Coal No. 5 does not appear to be developed at this point.

### Washington County.

The geological formations which outcrop at the surface, with their estimated thickness, are given by Mr. Henry Englemann in the Geol. Sur. Ill., III, 148, as follows:

Upper sandstone formation..... 200-250 feet.

(Worthen considers the thickness here given an over-estimate, and thinks 100 feet to be a much nearer approximation).

Shoal Creek limestone..... 7 feet.

Slaty division..... 15-50 "

Lower sandstone formation..... 270 "

The Quaternary, which covers the county as with a blanket, varies from ten to fifty feet, and at some points is still thicker. But few outcrops embracing any considerable vertical thickness, were met with.

### SECTION X.

Outcrops on Williams creek, on the south half of section 22, township 2 south, range 4 west. Top section about 470 feet above sea level.

- |                                                       |         |
|-------------------------------------------------------|---------|
| 1. Shale, bluish, somewhat marly, exposed.....        | 3 feet. |
| 2. Sandstone, soft, massive, micaceous.....           | 4 "     |
| 3. Shale, argillaceous, bluish.....                   | 2 "     |
| 4. Interval not exposed, probably shale.....          | 7 "     |
| 5. Shale, argillaceous.....                           | 6 "     |
| 6. Sandstone, thinly stratified, soft, micaceous..... | 2 "     |
| 7. Sandstone, massive, micaceous, exposed.....        | 2 "     |

Total thickness..... 26 feet.

No. 5, in the above, presents a peculiar appearance. Undoubtedly a coal measure stratum and *in situ*, it showed, irregularly distributed on the face of the exposure, two large, exceedingly hard limestone boulders and one sandstone boulder, and a large number of pebbles, the whole reminding one of some deposits of the drift formation. Is this debris of an ancient iceberg or glacier

—a carboniferous glacial period? Unfortunately, but a few feet were exposed, so that nothing definite could be ascertained.

## SECTION XI.

Outcrop on Elkhorn creek, on northeast quarter of section 32, township 2 south, range 4 west. Elevation above sea level of the top of the section, about 460 feet.

1. Sandstone, soft micaceous, forming an overhanging bluff, probably underlaid by shale, exposed thickness ..... 20 feet.

## SECTION XII.

Outcrops on Elkhorn creek and its branches, in the vicinity of Oakdale, on sections 14 and 15, township 3 south, range 4 west. Top of section about 520 feet above sea level.

1. Sandstone .....	8 feet.		
2. Shale, black.....	0 "	8 inches.	
3. Shale, sandy.....	1 foot.		
4. Limestone, impure, with carbonaceous material disseminated.....	0 feet 4 "		
5. Clay, shale, greenish and grayish.....	3 "		
6. Limestone, impure, hard, splintery, locally termed "bastard," quarried for foundations.....	1 foot 3 inches to 0 "	8 "	
7. Clay shale.....	2 "		
8. Not exposed, probably clay shale, about	5 "		
9. Sandstone, micaceous.....	20 "		
10. Clay shale.....	5 "		
11. Sandstone and sandy shale.....	25 "		
Total thickness.....	70 feet	8 inches.	

Top of the above section is about seventy feet below the top of the Lower Coal Measures. Judging from the depth beneath the surface of Coal No. 6, at Coulterville and at Nashville, at Oakdale Coal No. 6 will be found at a depth of about 340 feet below the surface.

## SECTION XIII.

Coal shaft at Nashville, Ill. Record kindly furnished by Col. L. H. Krughoff. Top of shaft about 510 feet above sea level.

1. Yellow clay.....	15 feet.	
2. Sand .....	8 "	
3. Pale yellow clay.....	7 "	
4. Blue clay.....	8 "	
5. Blue shale.....	4 "	6 inches.
6. Limestone, Shoal creek.....	6 "	6 "
7. Black shale.....	4 "	
8. Coal No. 9.....	2 "	
9. Clay shale.....	6 "	
10. Sandstone .....	8 "	
11. Sandy shale.....	47 "	
12. Limestone .....	0 "	4 inches.
13. Blue shale .....	14 "	
14. Conglomerate of clay, gravel and limestone .....	2 "	
15. Black shale.....	1 foot 6 "	
16. Fire clay.....	4 feet.	
17. Clay shale.....	8 "	
18. Sandy shale.....	25 "	
19. Soft sandstone.....	22 "	
20. Blue shale.....	26 "	
21. Coal No. 7.....	1 foot 2 "	
22. Fire clay.....	1 " 8 "	
23. Conglomerate of sand and limestone.....	4 " 6 "	
24. Sandy shale.....	63 "	
25. Blue and black shale.....	43 "	
26. Fire clay.....	1 foot 8 "	
27. Blue shale .....	3 feet.	
28. Fire clay .....	4 " 6 "	
29. Soft rock, mixture of sand and limestone .....	5 "	
30. Fire clay.....	1 foot 6 "	
31. Hard limestone.....	15 feet 10 "	
32. Black shale.....	3 " 8 "	
33. Blue shale, with boulders and lime rock..	3 "	
34. Sandy shale.....	5 "	
35. Sandstone .....	9 "	
36. Fire clay.....	1 fo "	
37. Blue shale.....	2 feet	

38. White shale.....	0 feet 6 inches.
39. Limestone .....	4 " 2 "
40. Dark blue shale.....	2 " 6 "
41. Fossiliferous limestone .....	0 " 10 "
42. Dark blue shale.....	7 " 6 "
43. Black limestone.....	4 " 6 "
44. Dark gray limestone.....	3 " 6 "
45. Black shale .....	2 " 8 "
46. Coal No. 6 .....	6 "

Total depth ..... 420 feet.

If No. 46 is really the No. 6 coal, which seems to be the general opinion, the general section of the Coal Measures given in Geol. Sur. Ill., VI., 2-4, does not give sufficient thickness of strata between Coal No. 6 and the Shoal creek limestone. In 1889 a drill hole was put down at Nashville to the depth of 1,000 feet, or somewhat more, but if a record was kept, about which there is some dispute, repeated efforts have failed to obtain it.

#### SECTION XIV.

Outcrop on Locust creek, about the middle of section 24, township 3 south, range 3 west. Top of section about 410 feet above sea level.

1. Clay and gravel (Quaternary).....	20 feet.
2. Shale, soft, micaceous, sandy.....	8 "
Total thickness.....	28 feet.

#### SECTION XV.

Outcrop on Watering creek, on the northeast quarter of section 18, township 3 south, range 2 west. Top of section about 420 feet above sea level.

1. Clay and gravel (Quaternary).....	
2. Limestone.....	0 " 4-6 "
3. Shale .....	10 "
4. Sandstone layer, soft.....	1 foot.
5. Shale, argillaceous .....	10 feet.
6. Sandstone, hard.....	0 " 8-10 "
Total thickness.....	22 feet 4 inches.

## SECTION XVI.

Outcrop on Beaucoup creek, on the northwest quarter of section 35, township 2 south, range 2 west. Top of section is about 470 feet above sea level.

1. Soil and clay (Quaternary).....	
2. Shale, argillaceous, bluish.....	1 foot.
3. Coal No. 9.....	0 feet 6 inches.
4. Shale, black, carbonaceous.....	3 " 6 "
5. Shale, argillaceous, partly nodular.....	7 "
Total thickness.....	<hr/> 12 feet.

A short distance below where the section was taken, fragments of the Shoal Creek Limestone were found in the bed and on the banks of the creek, but no outcrops could be found showing the limestone in place. Hence I could not determine how great a distance intervened between the Coal No. 9 and the Shoal Creek Limestone at this point.

## SECTION XVII.

Outcrops adjacent to Little Muddy river, on the west half of section 27, township 3 south, range 1 west. Top of section about 510 feet above sea level.

1. Sandy shale and thinly stratified sandstone.....	20 feet.
2. Sandstone, even-bedded, layers from three to twelve inches thick, has been largely quarried.....	4 "
Total thickness.....	<hr/> 24 feet.

## Perry County.

The line of the section passes diagonally through the northeast township of the county. The few surface outcrops are near the dividing line between the Upper and Lower Coal Measures. A bed of sandy shale, about 15 feet thick, was seen near Little Muddy river, on the northeast quarter of section 3, township 4 south, range 1 west, the same bed as No. 1 in Section XVI.

## SECTION XVIII.

Outcrop on northeast quarter section 13, township 4 south, range 1 west. (Geol. Sur. Ill., III, 96). Top of section is about 485 feet above sea level.

1. Gray shale, with nodules of iron.....	3 feet.
2. Hard, bluish-gray limestone (Shoal Creek)	5 "
3. Shale .....	4 " 6 inches.
4. Coal No. 9.....	1 foot.
5. Clay shale.....	6 feet.

Total thickness.....	19 feet 6 inches.
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## Jefferson County.

The line of the section cuts diagonally the southwest corner of Jefferson county. The very few surface exposures represent the lowest strata of the Upper Coal Measures, the Shoal Creek Limestone being but a short distance beneath the surface.

## SECTION XIX.

Outcrop on Little Muddy river and adjacent hillside, near the line between sections 30 and 31, township 4 south, range 1 east. Top of section about 480 feet above sea level.

1. Sandy shale .....	10 feet.
2. Interval not exposed, probably shale.....	10 "
3. Sandstone, soft, ferruginous, partly massive, partly evenly stratified.....	8 "

Total thickness.....	28 feet.
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## Franklin County.

The surface of the northern part of the county traversed by the line is rolling, but presents no great variation in altitude, hence outcrops are few, and but limited in vertical extent. The Quaternary varies from 10 to 30 feet in thickness. All the outcrops belong to the lower part of the Upper Coal Measures.

On a small branch in section 5, township 5 south, range 2 east, an exposure of three feet of micaceous

sandstone was seen. No other exposures were met on the Big Muddy river or its affluents in the northwestern part of the county.

Two miles north of Benton, on the west half of section 6, township 6 south, range 3 east, an outcrop of about thirty feet of soft, brownish, ferruginous sandstone, with some sandy shale interstratified, has been quarried for building purposes.

About two and one-half miles northeast of Benton, in the northeast quarter of section 9, township 6 south, range 3 east, an outcrop of soft, ferruginous, micaceous sandstone, of about 20 feet, underlaid with two or more feet of clay shale, with concretions, usually of small size, of kidney iron ore, and with the fragmentary remains of fossil plants, occurs on a small branch. A little farther on, near the center of section 36, township 5 south, range 3 east, the wagon road cuts through sandstone and sandy shale, exposing about six feet.

In a small run in township 7 south, range 4 east, on section 12, probably was seen an exposure of clay shale, with concretions of kidney iron ore.

These were all the outcrops examined in Franklin county. The only boring at all near the line, of which I could learn, and it too shallow to give much information, is the following section.

#### SECTION XX.

Boring at Parrish, Ill., near the line of the St. Louis & Paducah R. R. Surface about 450 feet above sea level. Data furnished by Mr. J. N. Bryant.

1. Soil and clay.....	3 feet.
2. Sandstone.....	11 "
3. Carbonaceous shale.....	3 "
4. Coal (No. 8?).....	1 foot.
5. Clay shale.....	30 feet.
6. Sandstone.....	12 "
<hr/>	
Total thickness.....	60 feet.

**Hamilton County.**

But one small exposure was discovered in the southwestern corner of Hamilton county, about one-half mile east of the county line, on section 6, township 7 south, range 5 east, where about six feet of a micaceous sandstone outcropped.

**Saline County.**

The geological formations outcropping, are:

Upper Coal Measures.

Lower Coal Measures.

Chester Group.

The exposures of the Chester are in an axis of uplift in the southeastern part of the county, several miles southwest of the line, known as the Eagle mountains. The few outcrops discovered belong to the Upper Coal Measures.

About one-half mile north of Gallatia, some 25 feet of shale are exposed, with about three feet of the underlying sandstone.

**SECTION XXI.**

Boring at Ledford, on section 29, township 9 south, range 6 east, about ten miles southwest of the line of the section. Surface about 420 feet above sea level. These strata belong to the Lower Coal Measures.

1. Loess .....	13 feet.
2. Hard sandstone.....	6 "
3. Gray shale.....	2 "
4. Sandstone .....	7 "
5. Gray shale.....	2 "
6. Hard sandstone.....	6 "
7. Hard, dark shale.....	2 "
8. Hard sandstone .....	3 "
9. Sandstone and shale.....	9 "
10. Soft sandstone.....	17 "
11. Coal No. 6.....	5 "
12. Soft sandstone.....	45 "

Total thickness..... 117 feet.

## Gallatin County.

The geological formations of this county are Lower Coal Measures and Chester Group. The latter occupies the hilly or mountainous country in the southwestern corner of the county. Along the line only Coal Measure strata appear at the surface.

## SECTION XXII.

Outcrop on east bank of the North fork of the Saline river, on the northeastern quarter of section 22, township 8 south, range 8 east. Top of section 390 feet above sea level.

1. Soil and clay.....	
2. Shale, arenaceous, ferruginous.....	3 feet.
3. Shale, dark blue, argillaceous, contains nodules of kidney iron ore.....	30 "
4. Shale, arenaceous, micaceous.....	12 "
5. Limestone, chert-like, splintery, much cracked and seamed at the surface.....	3 " 6 inches.
6. Shale, black, friable, exposed.....	4 "
Total thickness.....	52 feet 6 inches.

## SECTION XXIII.

Strata at north end of Equality, at Peter Brightner's coal mine, on section 17, township 9 south, range 8 east. Data from Mr. Brightner. This section overlies the next (XXIV) at some interval, which I had no means of determining.

1. Sandstone .....	30 feet.
2. Fire clay .....	1 foot.
3. Limestone "bastard," very hard .....	4 feet.
4. Black shale.....	0 " 6 inches.
5. Coal No. 7 .....	4 "
6. Fire clay .....	2 "
Total thickness.....	41 feet 6 inches.

## SECTION XXIV.

Outcrops at Equality, on southeast quarter of section 17, township 9 south, range 8 east. Top of section about 430 feet above sea level.

1. Sandstone, ferruginous, micaceous.....	10 feet.
2. Argillaceous shale.....	15 "
3. Coal (No. 6?).....	1 foot 6 inches.
4. Shales and sandstone.....	40 feet.

Total thickness.....	66 feet 6 inches.
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## SECTION XXV.

Record of the Shawneetown Gas and Oil Co.'s well boring, made 1887-8. As a churn drill was used, the thickness assigned the various strata is only approximately correct. Surface about 350 feet above sea level.

1. Clay, sand and gravel.....	110 feet.
2. Hard, flinty rock.....	2 "
3. Soft, black slate.....	10 "
4. Soft sandstone.....	10 "
5. Fire clay.....	1 foot 6 inches.
6. Shale.....	80 feet.
7. Coal No. 7.....	7 "
8. Shale.....	78 "
9. Coal No. 5.....	5 "
10. Clay shale.....	130 "
11. Sandstone.....	15 "
12. Shale, lower part producing a limited amount of gas.....	96 "
13. Sandstone.....	20 "
14. Shale.....	30 "
15. White sandstone, with some oil.....	50 "
16. Shale.....	10 "
17. Coal No. 1.....	2 "
18. Slate.....	25 "
19. Clay shale.....	37 "
20. Black shale.....	10 "
21. Soft blue sandstone (salt water).....	55 "
22. Sandy shale.....	60 "

23. Soft white sandstone.....	20 feet.
24. Sandy shale.....	15 "
25. Clay shale.....	25 "
26. Sandy shale.....	40 "
27. Shale.....	30 "
28. Hard white sandstone.....	30 "
29. Soft shale.....	5 "
30. Hard sandy shale .....	40 "
31. Shale .....	60 "
32. Hard sandstone (salt water).....	190 "
33. Soft shale.....	10 "
34. Shale .....	15 "
35. Hard sandstone (salt water).....	50 "
36. Shale .....	10 "
37. Hard sandstone.....	70 "
38. Limestone .....	30 "
39. Hard sandstone.....	10 "
40. Soft sandstone.....	20 "

Total depth..... 1513 feet 6 inches.

Nos. 1-27 may be regarded as Lower Coal Measures proper; Nos. 28-37 as the Conglomerate. The dividing line is seldom well marked, and may be drawn somewhat higher or somewhat lower in the series without doing any violence. No. 38 marks the highest limestone of the Chester Group. This makes the thickness of the conglomerate 480 feet at this point—very much greater than has been hitherto thought. Prof. A. H. Worthen, in the Geological Survey of Illinois, volume VI, pp. 2-5, where an exhaustive section of Coal Measures strata is given, says that the thickness of the coarse sandstone or conglomerate forming the base of the Coal Measures, usually range from 20 to 110 feet. Possibly only Nos. 35-37 should be regarded as Conglomerate; this gives a thickness of 130 feet. In this event, there is a vastly greater accumulation of strata between the Conglomerate and Coal No. 1 than is given in Prof. Worthen's section above referred to.

## SECTION XXVI.

Outcrop on bank of Ohio river, in front of Shawnee-town. (Compare Geol. Sur. Ill., VI, 198). Strata all dip to the south, at an angle varying from  $10^{\circ}$  to  $25^{\circ}$ . Estimates of thickness are somewhat doubtful approximations. The vertical thickness of the strata is given, not the amount of space occupied horizontally. The section crosses the upturned edges from north to south.

1. Black shale, with concretionary bands of clay iron-stone interstratified .....	15 feet.
2. Hard, black, bituminous shale .....	6 "
3. Coal .....	2 "
4. Bluish shale, with irregular beds of thin, fine-grained sandstone interstratified .....	12 "
5. Shale, gray or dove-colored .....	10 "
6. Arenaceous shale .....	6 "
7. Argillaceous shale .....	30 "
8. Sandstone, hard, fine-grained .....	20 "
9. Shale and sandstone, layers alternating .....	10 "
10. Shale, arenaceous, micaceous .....	3 "
11. Sandstone, fine-grained .....	10 "
12. Shale, bluish, arenaceous, micaceous .....	4 "
13. Sandstone, ferruginous .....	30 "

Total thickness..... 158 feet.

14. Interval not exposed.

15. Sandstone, soft, ferruginous, *horizontal*, exposed, 5 feet.

The indications are that there is a fault between Nos. 13 and 15, but the limited examination I could make, and the insufficient exposure, furnished me no data for establishing the surmise.

These strata belong to the lowest part of the lower Coal Measures, in part to the basal sandstone known as the Conglomerate.

## Geological Section in Southern Illinois through Waterloo, Sparta, Murphysboro and Olmstead.

### Introductory.

This line essentially parallels the Mississippi River at a distance from it of from 15 to 20 miles. Beginning with the Lower Carboniferous it crosses the southwestern border of the Lower Coal Measures, again issues upon the Lower Carboniferous and leaves the State after passing through the Tertiary in Pulaski county. The line changes direction at Sparta and Murphysboro, bending each time more towards the south.

### Monroe County.

Monroe is one of the most interesting counties in the State to the geologist and paleontologist. The outcropping strata over a large part of the county belong to the Lower Carboniferous, or Subcarboniferous, for which term Mississippian is now being substituted, a formation abounding with a wealth of fossils often exquisitely preserved. In the extreme northern part the county is crossed by an axis of disturbance, bringing to the surface some of the lower formations; entering from Missouri the uplift causes quite a dislocation near Salt Lick Point, and disappears southeastwardly.

The following table of geological formations, having surface outcrops, is taken from the Geol. Sur. Ill. V., 270.

Coal measures.....	40- 50 feet.
Chester group.....	100-350 "
Upper St. Louis limestone.....	140-150 "
Lower St. Louis or Warsaw beds.....	120-130 "
Keokuk limestone.....	150 "
Burlington limestone.....	75-100 "
Kinderhook group.....	80-100 "
Trenton limestone (in part).....	120 "

No boring could be found which would give an idea of the underground geology. An artesian well was put down at Waterloo some years ago, but no record seems to have been kept. The time at my disposal was too limited to enable me to make much exploration of the surface outcrops.

#### SECTION XXVII.

Outcrops along Fountain Creek on sections 27 and 34, township 2 south, range 10 west. Strata dip to the west at a low angle. Top of section about 540 feet above sea level. All strata belong to the St. Louis group.

1. Limestone, in layers from four inches to four feet thick, with occasional shaly or marly partings between layers, fossiliferous, some layers weathering cherty.....	15 feet.	
2. Limestone, cherty fossils numerous, mainly bryozoa and brachiopoda.....	5 "	
3. Limestone, quarried for building purposes..	12 "	
4. Marl layer with a peculiar assemblage of small fossils, mainly gasteropoda, pen- tremites and bryozoa, varying in thick- ness from 2 inches to 10 inches, averaging	0 "	6 inches.
5. Limestone.....	4 "	
6. Marly or shaly layer contains most abund- antly an undescribed species of stenopora	0 "	4 inches.
7. Limestone, fossiliferous.....	5 "	
Total thickness. ....	41 feet 10 inches.	

#### SECTION XXVIII.

Outcrop on small branch flowing into Prairie du Long creek, on west half of section 21, township 3 south, range 8 west. Top of section about 450 feet above sea

level. All the strata belong to the Chester group, but the exact position in the series has not been determined.

1. Limestone layers with shaly partings.....	8 feet.
2. Limestone layer.....	2 "
3. Limestone layers with shaly and marly partings.....	5 "
4. Limestone layer.....	1 foot.
5. Shale and marl with thin slabs of limestone intercalated.....	9 feet.
6. Limestone layer.....	0 " 8 inches.
7. Limestone layers with shale partings.....	4 feet 6 "
8. Blue marly shale .....	1 foot 3 "
9. Limestone layers.....	4 feet.

Total thickness.....	35 feet 5 inches.
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All the limestones in the above sections are fossiliferous, but the shales and marls much more so. Brachiopods, pentremites and fragments of crinoids are common, but the bryozoa are by far the most numerously represented, the genera *Fenestella*, *Archimedes* and *Rhombopora* leading in representation. More examples of the rare *Coelocomus granosus*, Ulrich, have been obtained from this locality than from any other though it is a widely distributed form.

My studies in the Chester Group confirm the earlier observations of Prof. Worthen, that the different beds of the Chester so much resemble each other lithologically and in their fossil contents, that the identification of the various beds, either by their fossils or lithological characters, is impossible. It may be that long-continued, painstaking, patient collection and study of the fossils will serve to discover some distinctive or particular horizons, so that eventually we may be able to say just where in the series any given outcrop belongs; but at present, unless continuous outcrops showing relative superposition give the clue, we are unable to place any given outcrop in its proper place.

### Randolph County.

The geological formations seen at the surface in this county are the Lower Coal Measures, including the Conglomerate, the Chester Group and the St. Louis Group. The line of the section cuts the northern and eastern parts of the county, and all the outcropping strata passed over belong to the Chester and Lower Coal Measures.

It is in this county that the Chester has its typical development; for comparison with what follows, Prof. Worthen's tabular presentation is given. (Geol. Sur. Ill., I, 284).

### Chester Group.

1. Gray, compact, siliceous limestone No. 1.....	25-30 feet.
2. Shale and shaly sandstones, partially exposed...	80-90 "
3. Shaly limestone No. 2.....	15-18 "
4. Massive brown sandstone.....	40
5. Limestone No. 3.....	40-45
6. Green and blue argillaceous shales, with plates of limestone.....	45-70
7. Arenaceous and argillaceous limestone No. 4....	20-30
8. Massive and shaly sandstone.....	15-20
9. Compact and granular gray limestone No. 5, with intercalations of blue, green and purple shales, about.....	150 "
10. Massive quartzose brown sandstone.....	120 "

I have, in this report, adopted the numbering of the limestone beds as given above, though afterwards, in the reports of the Geological Survey, in the chapters describing the geology of Johnson, Massac, Pope and Hardin counties, the beds are differently numbered.

Whether detailed study will bear out this division into five different successive limestone beds, each with an underlying sandstone except No. 3, I am not prepared to say. There may also be some doubt whether these sandstones are continuous over wide areas.

## SECTION XXIX.

Strata displayed in hillside northwest of court house at Chester, Ill., from top of hill to river level (ten feet of water in the channel).

1. Not exposed, elsewhere shown to be sandstone in lower part.....	73 feet.
2. Limestone .....	1 foot.
3. Green, blue and purple shales.....	12 feet.
4. Limestone, regularly bedded.....	10 "
5. Limestone, irregularly bedded, partly nodular and argillaceous .....	42 "
6. Green, blue and purple shales, partly marly, highly fossiliferous in places (Lyropora shale).....	53 "
7. Compact gray limestone....	27 "
8. Not exposed, elsewhere seen to be limestone mainly..	46 "
Total thickness.....	264 feet.

Nos. 4 and 5, above, are the Limestone No. 3 of the general section; No. 7, above, is the Limestone No. 4; and No. 8, above, is probably Limestone No. 5, in which case there is no sandstone at this place between Limestones Nos. 4 and 5. To No. 6 of the section above, I have given the name of Lyropora shale. It forms an easily recognized horizon, in which the bryozoan Lyropora, to whose stony supports, with the fenestration between lost or broken away, the name "frog mouths" has been popularly applied, is very characteristic. I have not yet succeeded in ascertaining whether the Lyropora is restricted to this shale and the underlying limestone, but at any rate it is rare, or wanting in strata higher in the series.

## SECTION XXX.

Boring made with diamond-core drill at Red Bud, Ill., in 1888. Data generously furnished by Mr. Geo. Saxemeyer. Surface about 450 feet above sea level.

1. Soil and clay.....	8 feet.		
2. Limestone .....	14 "	6 inches.	
3. Clay shale.....	11 "	1 "	
4. Sandstone .....	2 "	6 "	
5. Clay shale.....	7 "		
6. Clay shale and sandstone mixed.....	6 "	11 "	
7. Sandy shale.....	19 "	6 "	
8. Limestone .....	1 foot.		
9. Sandstone .....	0 feet	10 "	
10. Limestone.....	2 "	3 "	
11. Clay shale.....	2 "	4 "	
12. Limestone, with shale partings.....	25 "	7 "	
13. Green and brown shale.....	10 "		
14. Limestone and shale mixed.....	2 "	3 "	
15. Green and red shale .....	7 "		
16. Limestone, fossiliferous .....	3 "	6 "	
17. Red clay shale.....	1 foot.		
18. Sandstone .....	6 "	9 "	
19. Clay shale.....	13 "		
20. Sandstone and sandy shale.....	15 "	3 "	
21. Clay shale.....	15 "	9 "	
22. Sandstone and sandy shale.....	12 "		
23. Clay shale.....	15 "		
24. Sandy shale.....	3 "		
25. White sandstone, coarse, siliceous.....	63 "	6 "	
26. Hard limestone.....	198 "	6 "	
27. Limy sandstone.....	18 "		
28. Limestone .....	28 "		
29. Sandy limestone.....	12 "		
30. Limestone.....	64 "		
Total depth.....		580 feet.	

Expressed in geological terms, the preceding section reads:

Nos.			
1.	Quaternary.....	8 feet.	
2.	Chester Group—Limestone No. 4.....	14 "	6 inches.
3-7.	" —Sandstone and shale..	47 feet.	
8-17.	" —Limestone No. 5.....	55 "	9 "
18-25.	" —Sandstone (Aux Vases).	134 "	3 "
26.	St. Louis limestone.....	198 "	6 "
27-30.	St. Louis (Warsaw Division).....	122 "	
Total thickness.....		580 feet.	

## SECTION XXXI.

Outcrop of Chester Group strata on the Okaw or Kaskaskia river, on the northwest quarter of section 16, township 4 south, range 7 west. Top of section about 380 feet above sea level.

1. Limestone in ledges measuring 9, 8, 15 and 10 inches.....	3 feet 6 inches.
2. Marly shale, with abundance of characteristic fossils .....	1 foot.
3. Limestone, exposed.....	1 " 8 "
Total thickness.....	6 feet 2 inches.

## Natural Gas at Sparta.

## 1. BRIEF HISTORY.

A period of depression had fallen upon Sparta and the adjacent country. Something must be done to pull out from the slough of despondency into which all things had fallen. To Mr. W. B. Taylor was due the suggestion which led to the formation of a stock company, in December, 1887, to bore into the earth. The drill was started January 28, 1888, in the west end of the city of Sparta. Various delays and ill luck attended the drillers, but at length on the eighth of June, at a depth from the surface of 845 feet, most unexpectedly, gas with strong pressure and in large volumes burst forth. The discovery was as grateful as it was unexpected. For a time, in the absence of any means of holding it in or utilizing it, the gas was suffered to flow out unchecked, and many millions of feet went to waste. Meantime the large burning flame, twenty feet in height, aroused the surrounding country to a wonderful degree. But soon mains were laid, and the citizens were industriously piping their houses and putting gas burners into their stoves, and proceeded to enjoy nature's most impressive gift to man. Exploitation continued with the degree of success usually attending the drill.

A second well, one-half mile west of the first, gave no gas. A third well, one-half mile distant, in a southeasterly direction, gave an abundant supply. And now the usual cupidity came into play with the attendant wastefulness. An adjoining landowner put down a well as near No. 3 as he could get. Of course it was successful, but as it was draining the same territory it simply decreased the life of its predecessor. The following table shows the continuation of the exploitation, and the accompanying chart the location of the wells.

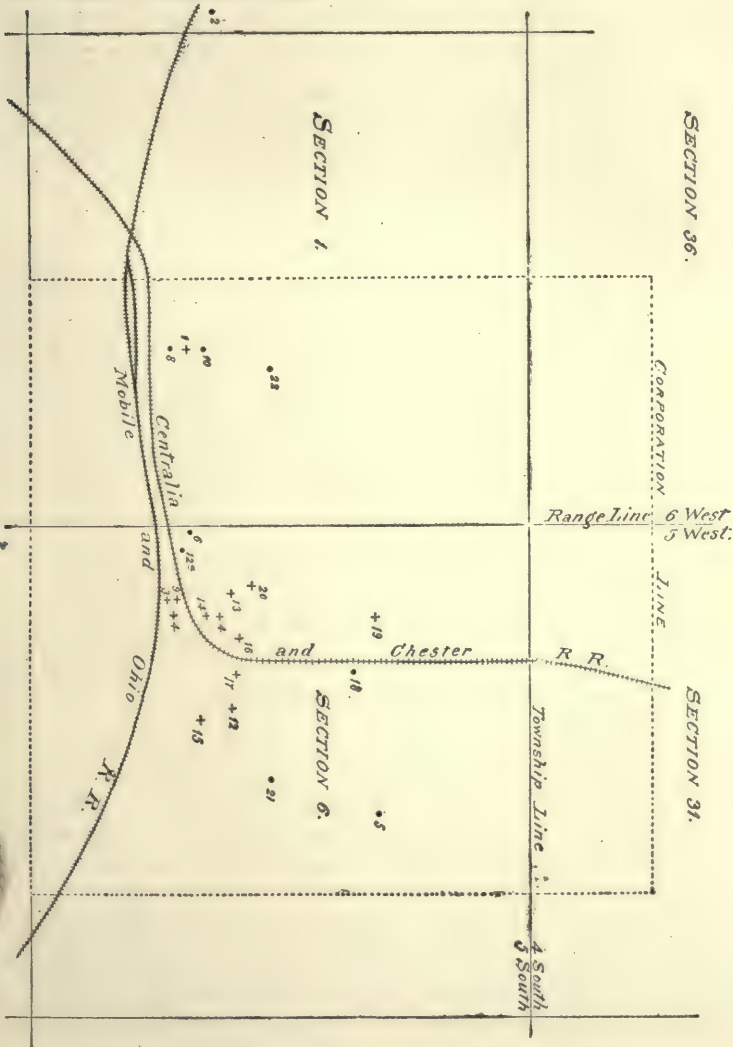
2. TABLE SHOWING EXPLOITATION.

Number of Well.	When Bored.	Result.	Present Condition
1	Jan.-June, 1888	Strong flow of gas .....	Produced but little after 1890; abandoned in 1893.
2	Aug.-Sept., 1888	No gas .....	.....
3	Sept.-Oct., 1888	Very strong flow of gas.....	Quit suddenly, June, 1894.
4	Oct.-Nov., 1888	Strong flow of gas .....	Still yielding slightly.
5	Dec.-Jan., 1889	Scarcely any gas .....	Never used.
6	Feb.-Mar. 1889	Small flow of gas; rock close textured.....	Never used.
7	April, 1889	Scarcely any gas .....	Never used.
8	June, 1889	A little gas; rock close textured.....	Never used.
9	Sept.-Oct., 1889	Strong flow of gas .....	Has ceased to yield.
10	Sept.-Dec., 1890	Abandoned before reaching gas rock with loss of tools.	.....
11	Oct.-Nov., 1891	Strong flow of gas .....	Still producing.
12	November, 1891	Strong flow of gas .....	Ceased producing suddenly.
12a	Nov.-April, 1892	Abandoned at 480 feet with loss of tools.....	.....
13	December, 1891	Strong flow of gas .....	Producing.
14	December, 1891	Strong flow of gas .....	Producing.
15	Jan.-April, 1892	Medium flow of gas .....	Producing.
16	April-May, 1892	Strong flow of gas .....	Producing.
17	January, 1893	Strong flow of gas .....	Producing.
18	Mar.-April, 1893	No gas; rock close textured.	.....
19	May-June, 1893	A moderate flow of gas.....	Producing a little.
20	Dec.-Jan., 1894	Medium flow of gas .....	Producing.
21	April.-May, 1894	No gas; rock close textured.	.....
22	June-Aug., 1894	.....	.....

# Diagram Showing Location of Wells.

*Sketch showing location of wells at Sparta.*

Productive gas wells +  
 N n-producing wells .  
 Scale: 2 inches = 1 mile.



### 3. RECORDS OF BORINGS.

Logs of the wells, showing the thickness of the strata passed through and kind of material, were kept of wells Nos. 1, 2, 3, 5 and 8, which will be given hereafter. None are very reliable, though No. 8 seems most worthy of confidence. No records have been preserved of later wells. In the earlier wells, the gas sand was penetrated from four to seven feet, but in the later wells, Nos. 12 to 20, the rock has been penetrated deeper, from ten to forty feet. Sometimes the flow has been increased by going deeper, other times not.

Had records of all the wells been preserved, an interesting chapter might have been written upon the topography prior to the glacial period. The depth of drift deposits varies from 34 feet, in No. 1 and 57 feet in No. 2, to 99 feet in No. 3, 116 feet in No. 5, 65 feet in No. 7, 70 feet in No. 8, 104 feet in No. 11, 109 feet in No. 13, 107 feet in No. 14, 120 feet in No. 16, 115 feet in No. 17, 94 feet in No. 15. These figures, even if not all accurate, indicate a very uneven surface under the drift, possibly the bed and banks of an ancient water-course.

### 4. ROCK PRESSURE AND FLOW.

The confined pressure of the wells had never been accurately determined. No. 1 exceeded 200 pounds, but how much was never known. No. 3 reached 350 pounds on a steam gauge, the limit of the gauge. The later wells, Nos. 12, 13 and 14, had an initial pressure of from 180 to 200 pounds. This accords with experience in other fields, that the pressure lessens as the field is opened up.

But one measurement had been made of the open or flow pressure—on No. 4, at an early date, by Mr. D. McConathy, of Louisville, Ky. This showed between four and five pounds through a two-inch pipe, which would

represent a production of something over a million feet per day. This is, however, a maximum under the best conditions.

### 5. LIFE OF WELLS.

No. 1 was greatly weakened by No. 3, which has probably produced a larger amount of gas than any other well. Nos. 3, 4 and 9, all within a few feet of each other, supplied the town for considerably more than two years; after which they still continued to yield, but had to be helped by additional wells. No. 3 has lasted about five and a half years; No. 4 is still yielding slightly, but shows signs of exhaustion. Seven years will represent the extreme life of a well in this area, under the best conditions. As the field is drained, the later wells cannot be expected to last as long or be nearly as productive as the early ones. During the winter of 1890-1, during the cold spells, the wells were allowed to flow freely, *i. e.*, without any back pressure. The next winter showed them greatly weakened.

### 6. PRODUCTION AND COST.

The following data, for which, with many others, I am indebted to Mr. D. P. Barker, the obliging secretary of the Sparta Natural Gas and Oil Co., were furnished to the agent of the Census Bureau. They cover the year 1889:

Total production of gas.....	80,830,000 cubic feet.
Waste from leakage and other causes.....	4,000,000       “
Consumed for domestic fuel (400 fires)....	54,000,000       “
Consumed in steam establishments (3)....	22,830,000       “
Gas sold for.....	\$3,842.30
Tons of coal required for equivalent work.	3,340
Value of coal displaced, at \$1.50 per ton..	\$5,010.00

The Gas Company furnished about two-thirds of the gas consumed, hence the total production of the field, for the year, would aggregate in the neighborhood of

120,000,000 cubic feet. As this was the year of maximum production, the total output of the field since its opening has fallen not far short of 500,000,000 cubic feet. This from a territory less than one mile square.

The amount of money expended by the Gas Company and private parties in developing the gas, has amounted, in round numbers, to \$60,000, composed of the following items:

Drilling, casing and equipping wells. ....	\$30,000
Pipe lines .....	15,000
Labor, repairs and miscellaneous items. ....	15,000

In addition, the piping of some 200 houses, paid for by the owners, at an average cost of \$25, amounts to \$5,000. To offset this amount of \$65,000 which has gone after the gas, there is an income of \$40,000 from the sale of gas. This corroborates experience in some other fields, that the gas involves an actual money loss. However, the convenience, comfort and cleanliness of gaseous fuel, fully compensate for its increased cost. When at its best, the gas supplied some 600 domestic fires, five steam establishments, and one brick-burning plant.

## 7. WELLS.

The wells have all been put down with a cable rig. Two attempts were made with a pole rig, but were failures. The time required to drill to gas rock has varied, but after some experience in handling the strata was acquired, it was no uncommon thing to go the 845 or 865 feet in two weeks. Most of the wells have been cased as follows: Eight inch drive-pipe to work, varying from 30 to 116 feet; next, five and five-eighths inch pipe to about 500 feet, to shut out water from the shales and sandstones resting upon Limestone No. 2; lastly, four and one-quarter inch pipe, with packer nearly to the gas

rock. In the earlier wells, the gas sands could seldom be drilled deeper than three or four feet. Later, some of these wells were deepened. In the later wells, the drill has usually been sent down from 14 to 40 feet after the gas was encountered.

## 8. EXTENT OF THE FIELD.

The area exploited at Sparta, covers less than two square miles. Although drilling in other parts of southern Illinois was stimulated by the discovery at Sparta, at no other place has gas been found in commercial quantities. Hence not enough is known to determine the extent or capacity of the field. That all the wells but one drilled without a small, well defined area, have proved failures, seems rather inexplicable. The records of the borings are not accurate enough to determine, in so small an area, what is the structure of the gas sand and adjoining strata, whether we have to deal with a quaquaversal or dome, or with an anticline. The sandstone, which serves as the holder for the gas, varies in porosity, being most porous in the strongest wells, and quite dense in those which have yielded little or no gas. Further exploitation may prove differently, but it looks as though we had here a small but once bountifully filled pocket, which is now (August, 1894,) rapidly nearing exhaustion.

## SECTION XXXII.

Borings at Sparta, Ill. Surface from 520 to 545 feet above sea level.

I have attempted, in the following table, to correlate the record of such of the gas wells as were kept by the drillers. The borings were made with a churn drill, the results of which are always inaccurate, and are made up with less or more of guess-work—usually more. In

this case the records are further corroded by the fact that the drillers were drillers, and not geologists or mineralogists. The men had no interest except to reach the gas sand as quickly as possible, and so, besides, being unable to always discriminate the strata, they were uninterested and careless. The record of well No. 3 is especially inaccurate. The drillers gave a depth of 886 feet to the gas sand, while 864 feet of casing were put into the gas sand. Of the logs given, that of No. 8 seems the most accurate.

The drilling was stopped whenever gas was found in quantity. If gas failed to come, the drilling was continued, as in wells Nos. 2, 5 and 8, until the water became salty. Below salt water, the drillers stoutly maintained, gas could not be found; they had all learned their lesson in the Ohio and Indiana field. That the conditions in this field might be different, was to them manifestly impossible. However, it is very improbable that more gas can be found by going deeper.

## CHESTER GROUP LOWER COAL MEASURES.

WORTHEN'S SECTIONS.	WELL No. 1.	WELL No. 8.	WELL No. 2.	WELL No. 3.	WELL No. 5.
Geol. Sur. Ill. 1, 281, 284-5 Econ. Geol. 1, 214, 217.	Bored by Laney & Churchhill	Bored by H. W. Carter.	Bored by C. P. Brandt.	Bored by C. P. Brandt.	Bored by C. P. Brandt.
Feet. Micaceous sand- stone and shale. 30-40	Feet. Soil & drift.. 34 Sandstone.... 30	Feet. Soil & drift.. 36 Clay & soft stone..... 34	Feet. Soil & drift.. 57	Feet. Soil & drift.. 99	Feet. Soil & drift.. 116
Limestone..... 3		Limestone... 14	Limestone .. 4	Limestone... 10	Limestone... 10
Shale..... 12	Shale ..... 35	Shale ..... 35	Coal (No. 7?) Slate..... 25	Coal (No. 7?) Limestone... 11 Clay shale... 2 Sandstone... 3 Slate..... 5	Coal (No. 7?) Limestone... 11 Clay shale... 2 Sandstone... 3 Slate..... 5
Limestone and bituminous shale 4-5	Belle ville limestone .. Shale & lime- stone..... 19		Limestone .. 12	Limestone... 17	Limestone .. 17

*Chester Group Lower Coal Measures—Continued.*

WORTHEN'S SECTIONS.	WELL No. 1.	WELL No. 8.	WELL No. 2.	WELL No. 3.	WELL No. 5.
Geol. Sur. Ill. 1, 281, 284-5. Econ. Geol. 1, 214, 217.	Bored by Laney & Churchill.	Bored by H. W. Carter.	Bored by C. P. Brandt.	Bored by C. P. Brandt.	Bored by C. P. Brandt.
Coal-Belleveille ... Feet.	Coal No. 6...	Feet. Coal & shale, 6	Feet. Coal..... 6	Feet. Coal..... 6	Feet. Coal..... 6
Fire clay & lime- stone..... 3-6	Limestone .. 8	Fire clay & shale ..... 6	Fire clay .... 2	Fire clay .... 2	Fire clay .... 2
Shale or shaly sandstone ..... 30-40	Shale ..... 8	Limestone... 8	Clay shale... 20	Limestone... 3	Limestone... 10
Limestone ..... 3-4	Limestone... 10	Slate..... 4			
Bituminous..... 3-5					
Coal No. 5 ?.....	Coal No. 5...	Coal No. 4...		Coal .... 4	Coal..... 4
Fire clay..... 2-4	Black slate.. 25 Limestone .. 5	Slate..... 14 Limestone... 10 Black slate.. 14	Limestone... 12 Slate..... 8	Limestone... 40 Shale ..... 13	Limestone... 40 Black slate.. 13
	Coal..... 2	Coal..... 4	Coal..... 4		

			Shale .....	35 Shale .....	38 Clay shale...	15 Limestone...	26 Limestone..	28
	Coal No. 2?		Coal.....	3 Coal.....	5		Coal .....	2
Shale and sandstone (conglomerate).....50-150			Clay shale... 45 Lime & sand. 20 Slate..... 35 Sandstone .. 10 Clay shale.. 40 Limestone .. 15 Slate..... 13	Fire clay & slate..... 29 Sandstone... 120 Limestone .. 20 Slate..... 20		Sandstone... 200 Clay shale.. 20	Sandstone... 117 Shale .....	10 2 5 3 6 39 20 2 80 3 7 19
Limestone .....25-30	Limestone No. 1.....		Limestone...	5 Limestone...	15 Limestone...	40 Limestone...	Limestone... 16	11
Shales and shaly sandstone .....80-90			Sandstone .. 25 Slate..... 10 Sandstone .. 40 Slate..... 80	Slate..... 80 Sandstone... 25 Caving soapstone .....	15	20 Shale .....	14 Caving slate. 60 22 Limestone.. 3 31 Black slate.. 17 Sandstone... 2 Clay shale... 7	

*Chester Group Lower Coal Measures—Continued.*

WORTHEN'S SECTIONS.	WELL No. 1.	WELL No. 8.	WELL No. 1.	WELL No. 3.	WELL No. 5.
Geol. Sur. Ill. 1, 281, 284-5. Econ. Geol. 1, 214, 217.	Bored by Laney & Churchill.	Bored by H. W. Carter.	Bored by C. P. Brandt.	Bored by C. P. Brandt.	Bored by C. P. Brandt.
<b>Feet.</b>	<b>Feet.</b>	<b>Feet.</b>	<b>Feet.</b>	<b>Feet.</b>	<b>Feet.</b>
Shaly limestone. 15-18	Limestone... 44	Limestone .. 15	Limestone... 64	Limestone... 13	Limestone... 16
Massive brown sandstone ..... 40	Slate..... 46 Sandstone .. 30	Slate..... 25 Sandstone... 30 Slate..... 15	Shale ..... 22 Sandstone... 10 Slate..... 20	Slate..... 5 Sandstone... 15 Slate..... 15 Limestone .. 24 Shale ..... 5	Slate..... 14 Limestone... 22 Shale ..... 31 Sandstone... 2 Clay shale.. 10
Limestone..... 40-45	Limestone No. 3.....	Limestone .. 30	Limestone .. 10	Limestone... 22	Limestone. . 13
Green and blue shales with plates of limestone.... 45-70	Clay shale... 104	Soft shale... 65	Conglomer'te Caving red- rock ..... 15 Slate..... 10	Slate..... 8	Clay shale... 20 Sandstone... 15 Red rock... 13 Slate..... 10

Limestone (sometimes shale) . . . 20-30	Limestone No. 4. . . . .	Limestone . . . 20	Limestone . . . 32	Limestone . . . 20	Limestone . . . 15	Limestone . . . 22
Massive and shaly sandstone . . . 15-20		Shale . . . . . 35	Sandstone . . . 28	Sandstone . . . 38	Slate . . . . . 3 Limestone . . . 53	Shale . . . . . 8 Sandstone . . . 7 Red slate . . . . 15
Limestone No. 5 compact, granular with intercalations of blue, green and purple shale . . . . . 150	Limestone No. 5. . . . .	Red slate . . . . 15 Limestone . . . 18 Slate . . . . . 22 Limestone . . . 13 Shale . . . . . 12	Light shale . . 55 Limestone . . 45	Clay shale . . . 67 Limestone . . 20 Clay shale . . . 22	Slate . . . . . 41 Limestone . . 11 Shale . . . . . 16 Sandstone . . . 4 Shale . . . . . 11 Sandstone . . . 5 Slate . . . . . 9 Sandstone . . . 4 Slate . . . . . 2	Limestone . . 16 Slate . . . . . 3 Limestone . . 53 Soft shale . . . 41 Limestone . . 13 Slate . . . . . 16
	Cras sand . . . . .	Sandstone . . . 5	Sandstone . . . 7	Sandstone . . . 5	Sandstone . . . 5	Sandstone . . . 5

*Chester Group Lower Coal Measures—Concluded.*

WORTHEN'S SECTIONS	WELL No. 1.	WELL No. 8.	WELL No. 2.	WELL No. 3.	WELL No. 5.
Geol. Sur. Ill 1, 201, 284-5 Econ. Geol. 1, 214, 217.	Bored by Laney & Churchill.	Bored by H. W. Carter.	Bored by C. P. Brandt.	Bored by C. P. Brandt.	Bored by C. P. Brandt.
		Feet. Shale ..... 6 Limestone... 16 Slate..... 41 Sandstone... 7 Limestone... 4 Sandstone... 4 Limestone.. 15 Salt water sandstone..	Feet. Dark gray stone..... 6 Slate..... 21 Limestone.. 14 Shale ..... 48 Limestone.. 4 Red slate... 40 White sand- stone..... 18 Red slate... 16 Limestone.. 5 Red sand- stone..... 11 Red slate... 2 Salt water sandstone.. 13		Feet. Caving slate. 11 Red slate.... 16 Limestone... 4 Sandstone... 15 Slate..... 8 Limestone.. 14 Red rock.... 8 Limestone.. 4 Salt water stone ..... 2
Massive quartzose sandstone ..... 120	Aux Vases sandstone of keys. ....				

In the following table are given some figures compiled from the preceding logs, showing thickness of formation, etc.:

	Well No. 1.	Well No. 8.	Well No. 2.	Well No. 3.	Well No. 5.
Elevation of top of well above sea level.....	545	545	535	525	520
Depth of well.....	850	948	1025	891	981
Depth from surface to gas sand .....	845	845	822	886	894
Depth to gas sand from top of first limestone beneath surface .....	781	775	765	787	778
Thickness of strata between the top of the first limestone and the top of Coal No. 6..	54	49	44	50	50
Thickness of Coal Measures (including conglomerate) from top of first limestone beneath surface.....	334	340	331	394	340
Thickness of Chester to base of Limestone No. 4.....	332	307	287	191	266
Thickness of Chester to top of gas sand .....	447	435	434	393	438
Thickness of Chester Lime- stone No. 5 to gas sand....	80	100	109	103	142
Total of Limestone No. 5 penetrated.....	80	203	312	103	229

It seems probable that well No. 2 penetrated into the basal sandstone of the Chester Group, but from the record it is impossible to exactly mark the beginning. In the record of No. 3, I am unable to locate the base of the Coal Measures. As I have placed it, the thickness is too great. To regard the "limestone 11 feet," which I have placed in the Conglomerate as Limestone No. 1 of the Chester, does not give nearly enough thickness.

## SECTION XXXIII.

From a comparison of the records of the wells and Prof. Worthen's sections, I have constructed the following ideal section, as it may be termed, to show what a fairly accurate record of drilling would disclose:

1. Soil and drift, about.....	40 feet.
2. Sandstone, at top more or less decomposed.....	30 "
3. Limestone.....	10 "
4. Coal (No. 7).....	2 "
5. Fire clay and shale.....	15 "
6. Limestone, with shale partings.....	22 "
7. Shale.....	0-3 "
8. Coal (No. 6).....	6 "
9. Fire clay and shale.....	6 "
10. Limestone.....	8 "
11. Shale.....	4 "
12. Coal (No. 5).....	4 "
13. Shale.....	8 "
14. Limestone, with shale partings.....	16 "
15. Shale.....	14 "
16. Coal (No. 3?).....	2-4 "
17. Shale.....	35 "
18. Coal (No. 2?).....	3 "
19. Sandstone and shale (Conglomerate).....	180 "
20. Limestone (No. 1 of Chester Group).....	20 "
21. Shale.....	15 "
22. Sandstone.....	40 "
23. Shale.....	17 "
24. Limestone (No. 2 of Chester Group).....	15 "

25. Shale.....	20 feet.
26. Sandstone.....	40 "
27. Shale.....	18 "
28. Limestone (No. 3 of Chester Group).....	30 "
29. Soft shale (Lyropora shale).....	65 "
30. Limestone (No. 4 of Chester Group).....	30 "
31. Sandstone.....	30 "
32. Shale and limestone.....	30 "
33. Shale.....	15 "
34. Sandstone (gas).....	7 "
35. Shale.....	20 "
36. Limestone.....	14 "
37. Shale.....	40 "
38. Sandstone and sandy shale (Aux Vases sandstone).....	120 "
<hr/>	
Total thickness.....	1046 feet.

Nos. 2-19 are Coal Measures, No. 19 being the basal sandstone (Conglomerate). Nos. 20-38 represent the entire thickness of the Chester Group, which, in this section, is made 636 feet. Prof. Worthen's section, referred to before, gives 613 feet.

Between Coal No. 6 and Coal No. 5, Prof. Worthen gives 30 to 40 feet of shaly sandstone. This must have been a mistake in stratigraphical correlation, as none of the borings bear this out, and the miners in the county state that the interval between Nos. 6 and 5 is only from 15 to 20 feet. All the mines of the county, with one or two exceptions in the neighborhood of Percy, work No. 6, though No. 5, while not so thick, is universally considered a finer coal. Probably Prof. Worthen identified a lower seam as No. 5. In his description of Randolph county, he considers that but two seams appear developed in this county. The drill indicates the presence of three, and perhaps four, seams.

## SECTION XXXIV.

Log of Isabella Thompson coal shaft, south of Eden, on the northwest quarter of section 8, township 5 south, range 5 west. Top of shaft 497 feet above sea level. Shaft put down July to September, 1888.

1. Soil and clay.....	3 feet.	
2. Yellow clay .....	17 "	
3. Blue clay .....	3 "	
4. Quicksand. ....	4 "	
5. Silt .....	2 "	
6. Gravel .....	4 "	
7. Silt .....	3 "	6 inches.
8. Quicksand and gravel.....	6 "	6 "
9. Silt, very pure and pale.....	8 "	
10. Silt, coarser, mouse-colored.....	3 "	
11. Hardpan or concrete.....	4 "	
12. Sand, fine, gray, close, firm.....	6 "	
13. Hardpan, sand and clay mixed .....	6 "	6 inches.
14. Silt .....	2 "	6 "
15. Boulder clay .....	6 "	3 "
16. Fine gravel.....	4 "	
17. Boulder clay.....	1 foot 9 "	
18. Laminated clay .....	5 feet.	
19. Nodular limestone, bluish gray.....	6 "	10 "
20. Clay shale.....	0 "	10 "
21. Coal (No 7?).....	1 foot 7 "	
22. Light, argillaceous sandrock.....	1 "	8 "
23. Fire clay.....	3 feet 2 "	
24. Blue clay shale.....	5 "	11 "
25. Buff-colored limestone.....	2 "	
26. Blue-banded limestone.....	1 foot 11 "	
27. Clay shale.....	3 feet 6 "	
28. Clouded gray and buff limestone.....	3 "	6 "
29. Fire clay parting.....	0 "	4 "
30. Bluish gray slate.....	3 "	1 "
31. Black limestone.....	2 "	
32. Buff and black spotted limestone.....	1 foot 1 "	
33. Gray and black lime bands.....	1 "	
34. Brownish gray limestone.....	3 feet 10 "	
35. Black slate.....	1 foot 8 "	
36. Coal No. 6.....	6 feet 6 "	
Total depth.....	140 feet	5 inches.

The section condensed, is:

1. Soil and drift.....	90 feet.
2. Limestone and shale.....	7 " 8 inches.
3. Coal (No. 7?).....	1 foot 7 "
4. Fire clay and shale.....	10 feet 9 "
5. Limestone.....	22 " 3 "
6. Black slate.....	1 foot 8 "
7. Coal No. 6.....	6 feet 6 "
<hr/>	
Total thickness.....	140 feet 5 inches.

The slate above Coal No. 6 is variable, ranging in thickness from 0 to 3 feet. The coal varies from 5 feet 10 inches to 6 feet 4 inches, being thickest where the black shale above it is thickest.

#### SECTION XXXV.

Boring at Coulterville, Ill. Record from Mr. J. Q. A. Nisbet, through the kindness of Mr. J. P. McClurken. Surface 545 feet above sea level.

1. Soil and drift.....	30 feet.
2. Slate.....	50 "
3. Clay shale.....	20 "
4. Black slate.....	40 "
5. Clay shale.....	15 "
6. Shale.....	45 "
7. Clay shale.....	20 "
8. Slate.....	75 "
9. Limestone.....	15 "
10. Coal (No. 6).....	7 "
11. Clay shale.....	30 "
12. Slate.....	25 "
13. Black slate.....	13 "
14. Coal.....	8 "
15. Slate.....	20 "
16. Limestone.....	7 "
17. Black slate.....	10 "
18. Limestone.....	5 "

19.	White slate.....	20 feet.
20.	Limestone.....	10 "
21.	Clay shale.....	25 "
22.	Limestone.....	20 "
23.	Clay shale.....	15 "
24.	Brown slate.....	20 "
25.	White sandstone.....	55 "
26.	Slate.....	40 "
27.	Sandstone.....	215 "
28.	Slate.....	10 "
29.	Limestone.....	10 "
30.	Slate.....	15 "
31.	Limestone.....	20 "
32.	Slate.....	40 "
33.	Red rock.....	10 "
34.	Limestone.....	40 "
35.	Red rock.....	30 "
36.	Limestone.....	20 "
37.	Slate.....	25 "
38.	Red slate.....	25 "
39.	White sandstone, salt water.....	17 "
Total depth.....		1117 feet.

If the record is at all correct, No. 14 above is probably Coal No. 3. If so, it shows unusual thickness at this point. It can hardly be No. 5, as it is too far below No. 6. As best I can interpret the record, Nos. 2-28 are Lower Coal Measures, Nos. 24-28 being the Conglomerate, giving it a thickness of 340 feet; Nos. 29-39 are the Chester Group, No. 29 being the Chester Limestone No. 1, No. 31 the Limestone No. 2, No. 34 the Limestone No. 3, No. 36 the Limestone No. 4, and No. 39 the horizon of the gas sand at Sparta. This interpretation makes the Coal Measures and Conglomerate much thicker here than at Sparta, and the Chester Group much thinner, but the total distance between Coal No. 6 and the gas sand horizon only about 75 feet greater than at Sparta.

## SECTION XXXVI.

Boring on Rurey farm, on northeast quarter of section 8, township 6 south, range 5 west. Record kindly furnished by Mr. C. E. Kingsbury. Surface about 450 feet above sea level.

1. Soil and drift.....	23 feet.
2. Slate and sand.....	4 "
3. Gray slate, with one foot of coal.....	37 "
4. Sandstone.....	6 "
5. Sandstone, dark.....	25 "
6. Sandstone and slate.....	30 "
7. Sandstone.....	159 "
8. Slate.....	16 "
9. Limestone.....	15 "
10. Slate.....	15 "
11. Limestone.....	70 "
12. Slate.....	30 "
13. Shale.....	16 "
14. Black shale.....	22 "
15. Limestone.....	112 "
16. Slate.....	62 "
17. Limestone.....	10 "
18. Slate.....	15 "
19. Limestone.....	73 "
20. Slate.....	7 "
21. Limestone.....	28 "
22. Slate.....	10 "
23. Slate and sandstone.....	16 "
24. Sandstone.....	6 "
25. Sandy shale.....	16 "
26. Slate.....	5 "
27. Sandstone.....	22 "
28. Limestone and shale.....	10 "
29. Shale.....	62 "
30. Sandstone.....	5 "
31. Shale.....	5 "
32. Sandstone.....	150 "
33. Limestone.....	207 "
<hr/>	
Total depth.....	1289 feet.

Expressed geologically, the section reads:

Nos.		Feet.	Feet.
1.	Quarternary .....	—	23
2-5.	Lower Coal Measures (proper).....	—	72
6-8.	Conglomerate .....	—	205
9.	Chester Group—Limestone No. 1.....	15	
10.	“ —Shale .....	15	
11.	“ —Limestone No. 2.....	70	
12-14.	“ —Shale .....	68	
15.	“ —Limestone No. 3.....	112	
16-18.	“ —Lyropora shale.....	87	
19.	“ —Limestone No. 4.....	73	
20.	“ —Shale .....	7	
21-31.	“ —Limestone No. 5.....	185	
32.	“ —Aux Vases Sandstone.....	150	
		<hr/>	782
33.	St. Louis Limestone.....		207
			<hr/>
	Total thickness.....		1289

The horizon equivalent to the Sparta gas sand is somewhere in No. 29. The Chester Group is 782 feet thick, or about 150 feet more than is indicated by the borings at Sparta.

#### SECTION XXXVII.

Well bored at Stellville with diamond core drill. Record given me by Mr. C. E. Kingsbury, who has taken an active part in promoting and keeping records of drillings. Surface about 450 feet above sea level.

1.	Soil and quicksand.....	60 feet.	
2.	Sandstone .....	48 “	
3.	Limestone.....	0 “	5 inches.
4.	Sandstone .....	2 “	7 “
5.	Coal.....	0 “	5 “
6.	Clay shale.....	8 “	7 “
7.	Sandy shales and sandstone.....	5 “	6 “
8.	Sandstone, with dark streaks.....	2 “	“
9.	Sandstone and sandy shale.....	7 “	
10.	Soft clay shale.....	9 “	2 “
11.	Striped sandy shale.....	1 foot	6 “
12.	White sandstone and striped sandy shale..	3 feet	6 “
13.	Limestone.....	0 “	4 “

14. Striped sandy shale.....	1 foot.
15. Dark clay shale.....	9 feet.
16. White sandstone.....	1 foot.
17. Dark sandy shale.....	4 feet.
18. Gray sandstone.....	1 foot 3 inches.
19. Limestone.....	0 feet 4 "
20. Sandstone and sandy shale.....	0 " 6 "
21. Dark shale.....	8 "
22. Sandstone.....	3 " 6 "
23. Hard rock.....	0 " 5 "
24. Striped sandstone.....	10 " 6 "
25. Hard rock.....	0 " 6 "
26. White and gray sandstone....	11 " 6 "
27. Limestone.....	0 " 1 "
28. Sandstone.....	3 "
29. Dark, coarse sandstone.....	0 " 3 "
30. White sandstone.....	34 " 2 "
31. Sandstone, with dark nodules.....	1 "
32. White sandstone.....	12 "
33. Dark, coarse sandstone.....	1 "
34. Conglomerate.....	0 " 2
35. Coarse sandstone.....	47 " 10
<hr/>	
Total depth.....	300 feet.

The greater part of this accurate section is Conglomerate, with a few overlying strata of the Lower Coal Measures proper. I am unable to draw this line in the record. Possibly No. 7 may be considered the top of the Conglomerate. Even an examination of the strata themselves is not always sufficient to decide, as the sandstones and shales of the two formations are very much alike. In fact, we may very much doubt the utility of attempting to separate the formations in the Illinois coal field, though in the Appalachian coal field the dividing line is easily drawn.

### Perry County.

The line of the section passes diagonally through the southwestern corner of Perry county. No exposures were seen near the line of the section. A very careful and accurate boring made on the line of the Wabash, Chester & Western Railroad, in July, 1887, at Galum creek, about four miles northeast of the line, is here given, to give some idea of the character of the strata comprised in the lower Coal Measures along this portion of the line. The record has been previously published in Geol. Sur. Ill., VIII, 56.

#### SECTION XXXVIII.

Boring at Galum creek, on section 35, township 5 south, range 4 west. Surface about 440 feet above sea level.

1. Soil and clay.....	17 feet 6 inches.
2. Black shale.....	1 foot 10 "
3. Dark blue limestone.....	8 feet 8 "
4. Black shale.....	2 " 6 "
5. Coal No. 6.....	5 " 10 "
6. Fire clay.....	1 foot 6 "
7. Limestone.....	1 " 3 "
8. Soft white shale.....	2 feet 3 "
9. Light gray limestone.....	2 "
10. Sandy shales.....	7 " 10 "
11. Hard white limestone.....	6 " 7 "
12. Hard gray shale.....	2 "
13. Hard blue limestone.....	0 " 6 "
14. Coal No. 5.....	4 " 8 "
15. Fire clay.....	11 " 1 "
16. Limestone.....	0 " 9 "
17. Shale.....	2 "
18. Sandy shale and sandstone.....	52 " 6 "
19. Blue shale, with limestone nodules.....	5 " 3 "
20. Fossiliferous limestone.....	1 foot 4 "
21. Black shal.....	8 feet 3 "
22. Coal No. 4.....	3 " 1 "
23. Gray clay shale.....	1 foot 8 "
24. Coal.....	0 feet 2 "
25. Dark shale, with sulphur nodules.....	2 " 4 "
26. Gray shale with pyrites.....	0 " 9 "

27. Gray shale .....	0 feet 10 inches.
28. Black shale, with limestone nodules.....	6 " 2 "
29. Limestone .....	0 " 1 inch.
30. Shale .....	13 " 10 inches.
31. Black shale.....	2 " 9 "
32. Coal No. 3.....	2 " 2 "
33. Gray shale .....	8 " 6 "
34. Limestone .....	6 " 9 "
35. Shale and sandstone .....	3 " 9 "
36. Shales, with bands of sandstone and limestone .....	15 " 7 "
37. Shale.....	9 " 8 "
38. Coal No. 2.....	1 foot 6 "
39. Green clay shale.....	0 feet 6 "
40. Limestone .....	0 " 11 "
41. Coal No. 2,.....	2 " 6 "
42. Fire clay.....	1 foot 7 "
43. Gray shale.....	0 feet 8 "
44. Sandy limestone.....	0 " 8 "
45. Gray shale .....	0 " 9 "
46. Dark shale.....	0 " 5 "
47. Soft coal and rock mixed .....	0 " 9 "
48. Brown and gray shales, with limestone nodules.....	7 " 6 "
49. Shale.....	12 " 9 "
50. Sandstone.....	4 " 6 "
51. Black shale, fossiliferous.....	1 " 11 "
52. Coal No. 1.....	3 " 5 "
53. Black shale.....	0 " 5 "
54. Dark sandy shales .....	8 " 7 "
55. Gray shale, with limestone nodules.....	1 foot 9 "
56. Shale.....	13 feet 5 "
57. Coal .....	1 foot 7 "
58. Dark shale, with limestone nodules.....	2 feet 2 "
59. Sandy gray shales.....	6 " 9 "
60. Shale, with streaks of coal.....	5 " 5 "
61. Shale .....	28 " 9 "
62. White sandstone, with streaks of coal.....	1 foot.
63. Coarse sandstone .....	14 feet 8 "
64. Pebbly conglomerate .....	1 foot.

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Total thickness ..... 344 feet.

No. 63 marks the top of the Conglomerate Division of the Lower Coal Measures.

**Jackson County.**

This is another very interesting county from a geological standpoint. The outcropping formations are given in the following table taken from the *Economical Geology of Illinois*, vol. 1, p. 505.

Lower Coal Measures, including conglomerate.....	500-600 feet.
Chester Group .....	800 "
St. Louis Group .....	250 "
Keokuk Group .....	150 "
Burlington Limestone .....	100 "
Hamilton Group .....	40-75 "
Corniferous limestone.....	20-30 "
Onondaga limestone.....	60 "
Oriskany Group (Clear Creek limestone).....	250 "
Lower Helderberg limestone.....	200 "

Along the line of the section the outcropping rocks are Lower Coal Measures exclusively. The Chester Group occupies a large area in the western and northwestern parts of the county, and the lower formations a rather small area in the southwestern part of the county.

**SECTION XXXIX.**

Outcrops along the line of the Mobile & Ohio Railroad between Bryden and Ava, on sections 28 and 29, township 7 south, range 3 west. Top of section about 550 feet above sea level.

1. Heavy-bedded sandstone.....	35 feet.
2. Shale with iron concretions.....	25 "
3. Interval not exposed, estimated at.....	10 "
4. Shale .....	3 "
5. Shaly sandstone .....	4 "
6. Sandstone.....	4 "
7. Shale .....	4 "
8. Sandstone thinly bedded .....	4 "
9. Sandstone ledge.....	2 "
10. Shale .....	4 "

11. Sandstone, heavy bedded with traces of plants.....	11 feet.	
12. Shale .....	4 "	
13. Sandstone, thinly bedded .....	3 "	
14. Sandstone.....	5 "	
15. Coal.....	.8 inches to 1 foot.	
16. Shale with remains of plants.....	0 feet.	6 inches.
17. Sandstone.....	3 "	
Total thickness.....		122 feet 6 inches.

The section is near the top of the Conglomerate and may embrace a few strata belonging to the Lower Coal Measure proper. I was unable to determine the exact horizon.

#### SECTION XL.

Boring at Murphysboro, 1888. Record kindly furnished me by Mr. W. H. Hull. Surface about 430 feet above sea level.

1. Soil and drift.....	98 feet.
2. Black shale .....	27 "
3. Coal No. 2.....	6 "
4. Blue shale.....	20 "
5. Gray sandstone .....	48 "
6. Gray sandy shale.....	67 "
7. White sandstone.....	163 "
8. Blue shale.....	118 "
9. Limestone (?) .....	30 "
10. Light blue shale.....	20 "
11. Dark shale .....	25 "
12. Limestone .....	3 "
13. Dark blue shale .....	10 "
14. Gray limestone .....	18 "
15. Dark blue shale .....	13 "
16. Limestone.....	54 "
17. Bituminous shale.....	2 "
18. Light blue shale.....	20 "
19. Gray sandy shale.....	16 "
20. Dark blue shale.....	4 "
21. Dark sandy shale.....	23 "

22.	Gray limestone.....	5 feet.
23.	Dark limestone.....	10 "
24.	Dark blue shale.....	25 "
25.	Limestone .....	14 "
26.	Dark blue shale.....	11 "
27.	Dark sandy shale .....	13 "
28.	Gray sandstone .....	15 "
29.	Dark limestone.....	12 "
30.	Dark blue shale .....	44 "
31.	Dark limestone.....	4 "
32.	Gray limestone. ....	30 "
33.	Dark limestone.....	22 "
34.	Blue shale.....	15 "
Total depth.....		1005 feet.

No. 9 is certainly an error, it should be sandstone.  
Expressed in geological terms the above section reads:

Nos.		Feet.
1.	Quaternary .....	98
2-6.	Lower Coal Measures.....	168
7-11.	Conglomerate .....	356
12-14.	Chester Group—Limestone No. 1 .....	31
15.	—Shale .....	13
16.	—Limestone No. 2.....	54
17-21.	—Sandy shale.....	65
22-23.	—Limestone No. 3.....	15
24.	—Lyropora shale .....	25
25.	—Limestone No. 4.....	14
26-28.	—Sandstone and shale .....	39
29-34.	—Limestone No. 5.....	127
		383
Total thickness.....		1005

#### SECTION XLI.

Boring made with diamond drill in 1892, near Murphysboro, on the northwest corner of the southwest quarter of section 34, township 8 south, range 2 west. Record furnished by Mr. J. D. Peters, the accomplished superintendent of the St. Louis Iron & Steel Co. Surface elevation about 445 feet above sea level.

1. Clay and sand .....	86 feet.		
2. Shale.....	30 "	6 inches.	
3. Dark blue shale, with concretions.....	33 "	5 "	
4. Coal No. 2.....	6 "	4 "	
5. Dark blue shale.....	15 "		
6. Gray sandstone.....	20 "		
7. Blue sandy shale, with black partings.....	3 "		
8. Gray sandy shale, with black partings.....	13 "		
9. Dark sandy shale, with black partings.....	30 "		
10. Bituminous shale.....	9 "		
11. Gray sandy shales, with black partings.....	7 "		
12. Brown sandstone.....	69 "		
13. Dark shales, with sand partings.....	35 "		
14. Light sandstone.....	5 "		
15. Dark shale, with sand partings.....	21 "		
16. Light sandstone.....	46 "		
17. Dark shale, with sand partings.....	3 "		
18. Sandstone.....	6 "		
19. Light sandy shale.....	5 "		
20. Light sandstone.....	51 "		
21. Sandstone, with traces of coal.....	0 "	1 inch.	
22. Light sandstone.....	34 "	11 inches.	
23. Dark sandy shale.....	3 "		
24. Dark blue clay shale.....	67 "	6 "	
25. Sandstone, with shale partings.....	1 foot	6 "	
26. Dark blue clay shale.....	3 feet.		
27. Sandstone, with shale partings.....	45 "		
28. Sandstone.....	9 "		
29. Limestone.....	1 foot.		
30. Blue clay shale, with sand partings.....	5 feet.		
31. Limestone.....	33 "		
32. Dark blue clay shale.....	10 "		
33. Limestone.....	26 "		
34. Clay shale.....	9 "		
35. Light sandy shale.....	23 "	6 "	
36. Soft coal and shale mixed.....	1 foot	6 "	
37. Sandstone.....	0 feet	6 "	
38. Soft coal and shale mixed.....	1 foot	6 "	
39. Light sandy shale.....	15 feet.		
40. Sandstone, with streaks of coal.....	42 "		
41. Limestone.....	1 foot.		
42. Dark clay shale.....	5 feet.		
43. Limestone.....	2 "		

44.	Dark clay shale.....	5 feet.
45.	Limestone.....	1 foot.
46.	Dark clay shale.....	3 feet.
47.	Light limestone.....	11 "
48.	Dark clay shale.....	5 "
49.	Light sandy shale.....	2 "
50.	Limestone... ..	5 "
51.	Dark clay shale.....	14 "

Total depth..... 881 feet.

Expressed geologically, the section reads:

Nos.		Feet.
1.	Quaternary .....	86
2-12.	Lower Coal Measures.....	237
13-28.	Conglomerate .....	336
29-31.	Chester Group—Limestone No. 1.....	39
32.	—Shale.....	10
33.	—Limestone No. 2.....	26
34-40.	—Sandy shale. ....	93
41-45.	—Limestone No. 3.....	14
46-49.	—Lyropora shale.....	21
50-51.	—Limestone No. 4.....	19
		<hr/> 222
Total thickness .....		881

## SECTION XLII.

Outcrop on hillside east of Makanda, Ill., on the west half of section 27, township 10 south, range 1 west. Top of section 725 feet above sea level.

1.	Soil and clay.....	10 feet.
2.	Conglomerate—Sandstone.....	150 "
3.	" —Shale and thin ledges of sandstone..	36 "
4.	Concealed to level of railroad track.....	52 "

Total thickness..... 248 feet.

About a mile and a half southeast of Makanda and not far from the county line, near the top of the conglomerate hill, occurs a bit of picturesqueness, which locally had received the name "Giant City". It consists

of a series of chasms or clefts varying from a foot to twelve feet wide, and in depth from a few feet to thirty or more, intersecting each other at various levels and varying angles. Whether this unusual structure is due to erosive or other agencies, the limited examination I could give failed to disclose.

At Moore, two miles south of Makanda on the Illinois Central Railroad, the conglomerate sandstone is quarried; the vertical face of the quarry, all white sandstone of excellent quality, measured 87 feet. Some of the layers are slightly stained with iron.

### Union County.

The line of the section passes not far from the middle of the county, cutting diagonally the townships in range 7 west. The conglomerate ridge crossing the northern part of the county gives it an almost mountainous aspect. Bald Knob, the highest elevation in southern Illinois, is about five miles west of the line. The formations outcropping are very much the same as in Jackson county, but do not run quite so high up in the series. The following formations were identified by the geological survey of the state.

Conglomerate sandstone.....	200 feet.
Chester Group.....	800 "
St. Louis Group.....	200-250 "
Kinderhook.....	80-100 "
Chemung (black slate).....	40- 60 "
Hamilton Group.....	60 "
Corniferous.....	25 "
Onondaga.....	60- 90 "
Oriskany (Clear creek).....	200-250 "
Lower Helderberg.....	250 "

No deep wells have come to my knowledge which would throw any additional light upon the above. A well 566 feet deep was sunk at the Southern Illinois Insane

Asylum, but no record was found. A few samples preserved showed the drill to have passed almost entirely through limestone, probably all of the St. Louis Group, stopping in the Warsaw division. If this interpretation is correct, though it is little more than guesswork, the St. Louis Group is thicker than indicated in the table of formation above.

The line of the section crosses successively the Conglomerate, the Chester and the St. Louis, the other formations being confined to the western side of the county.

#### SECTION XLIII.

Outcrop three and one-fourth miles south of Makanda, Ill., not far from the center of section 9, township 11 south, range 1 west. Top of section about 530 feet above sea level.

1. Thin bedded flaggy sandstone with fossil plants.....	7 feet.
2. Shale .....	5 "
3. Heavy bedded limestone, (Chester No. 1,) with characteristic fossils, exposed.....	18 "
Total thickness.....	30 feet.

This section shows the conformable superposition of the Conglomerate upon the Chester Group.

From the southwest quarter of section 16, township 11 south, range 1 west, for about two miles to Cobden, the railroad cuts through the sandstone, called No. 2, in the geology of Union county, by Prof. Worthen, lying immediately under the limestone No. 1. The thickness of the sandstone could not be measured as the exposures are not continuous. The sandstone which is mostly micaceous, lies in ledges from four to six inches thick.

#### SECTION XLIV.

Outcrops (not continuous) north and northeast of Anna, Ill., on sections 8 and 17, township 11 south, range 1 west. Top of section about 625 feet above sea level.

1. Limestone in ledges from one to twelve inches in thickness, with thin shale partings especially near the bottom; characteristic Chester fossils abundant .....	30 feet		
2. Shale, somewhat marly, dark green, purple, and chocolate in color, with numerous finely preserved bryozoa, also brachiopods usually crushed and pentremites .....	20	"	
3. Limestone heavily bedded.....	20	"	
4. Sandstone and sandy shale, only partially exposed.....	—		
5. Interval not exposed.....	—		
6. Limestone .....	6	"	
7. Green shale, destitute of fossils.....	1	"	
8. Limestone with few fossils .....	8	"	
9. Sandy layers, only partially exposed.....	—		
10. Interval not exposed .....	—		
11. Limestone becoming leached.....	—		
12. Crystalline limestone.....	2	"	8 inches.
13. Oolitic limestone .....	0	"	5 "
14. Crystalline limestone .....	2	"	8 "
15. Crystalline limestone, with characteristic St. Louis Group brachiopods and pentremites.....	15	"	
16. Oolitic limestone.....	5	"	

Nos. 1-9 belong to the Chester Group, Nos. 11-16 to the St. Louis Group. As the outcrops were not continuous there was no way of determining the thickness of the basal sandstone of the Chester, immediately overlying the St. Louis.

### Pulaski County.

The area of this county is occupied almost entirely by two formations, the St. Louis Group and the Tertiary. No records of deep wells or borings were discovered. The St. Louis consists of limestones presenting the usual characters. The Tertiary consists mainly of clay, micaceous sand derived from decomposed coal measure strata, and a ferruginous, pebbly, conglomerate.

## SECTION XLV.

Outcrop in hillside east of Pulaski, Ill., near the center of section 15, township 15 south, range 1 west. Top of section about 455 feet above sea level.

1. Soil, loam and clay.....	59 feet.	
2. Pebbly conglomerate.....	8 "	
3. Clay shale, bluish and drab.....	30 "	
4. Sand .....	1 foot.	
5. Impure lignite.....	0 "	2-4 inches.
6. Drab clay .....	1 "	
7. Sand, very fine and white.....	12 feet.	
8. Concealed to level of railroad track, probably sand .....	4 "	
Total thickness.....	115 feet	4 inches.

## SECTION XLVI.

Outcrops in the vicinity of Caledonia, Ill., on section 23, township 15 south, range 1 east. Top of section about 400 feet above sea level.

1. Soil and clay (quaternary) .....	25-30 feet.
2. Pebbly conglomerate.....	8-12 "
3. Clay shale.....	35 "
4. Sandy marl, greenish and brownish.....	18 "
5. Ferruginous sandstone.....	2-3 "
6. Bluish marl... ..	3 "
7. Purplish marl or variegated clay.....	6 "
8. Impure lignite.....	2 "
Total thickness.....	109 feet.

The beds underlying No. 8 were covered by the high water of the Ohio river which was about 32 feet above low water mark on the day when the above section was measured. In both the preceding sections the different deposits succeeded each other in the same order. Whether this is true of all the tertiary deposits in this end of the State, or whether there is an indiscriminate commingling of the various kinds of material, my field-work was too limited to determine.

In sinking the piers of the Illinois Central bridge over the Ohio an *Exogyra costata* was found in excavating showing that the Cretaceous exists under the bed of the Ohio; but no outcrop of Cretaceous has ever been recorded in Illinois.

In the course of this work one thought has forced itself upon me again and again. If only the State could be induced to undertake a series of borings and keep careful and exact records of the strata penetrated, our knowledge of the geology of Illinois would gain a wonderful expansion. There can hardly be a doubt but that such an undertaking would be in the highest degree beneficial even from a utilitarian and economic standpoint, while from a scientific standpoint the results would be incalculably valuable.

#### ADDENDA.

In the prosecution of the work the following additional sections were collected, which have not been previously published.

#### SECTION XLVII.

Shaft of coal mine and boring of Centralia Mining and Manufacturing Co., at Centralia, Marion county. The record of the shaft is given in Geol. Sur. Ill. VI, 5; since publication a boring with a diamond core drill was made from the bottom of the shaft. For convenience of reference and comparison with the next section, the entire section is here given:

1. Hard pan.....	2 feet	6 inches.
2. Yellow clay.....	9 "	6 "
3. Clay shale.....	11 "	
4. Blue slate.....	47 "	
5. Shale.....	0 "	8 "
6. Limestone.....	1 foot	6 "
7. Coal.....	0 feet	8 "
8. Blue slate.....	24 "	6 "
9. Clay shale.....	2 "	

10.	Limestone .....	5 feet	6 inches.
11.	Hard sandstone.....	5 "	
12.	Coal .....	0 "	2 "
13.	Soft sandstone .....	6 "	
14.	Coal .....	0 "	6 "
15.	Sandstone.....	2 "	6 "
16.	Coal .....	0 "	2 "
17.	Clay shale.....	4 "	
18.	Limestone .....	2 "	
19.	Sandstone.....	12 "	2 "
20.	Blue rock .....	1 foot	6 "
21.	Fire clay.....	2 feet.	
22.	Clay shale .....	15 "	6 "
23.	Blue slate.....	29 "	
24.	Limestone (Shoal Creek).....	11 "	
25.	Shale .....	5 "	6 "
26.	Coal .....	0 "	4 "
27.	Clay shale .....	4 "	
28.	Sandstone.....	10 "	
29.	Slate .....	50 "	
30.	Limestone .....	1 "	
31.	Shale .....	2 "	
32.	Clay shale .....	3 "	
33.	Sandstone.....	24 "	
34.	Blue slate.....	79 "	
35.	Coal.....	1 "	2 "
36.	Coal shale.....	3 "	
37.	Conglomerate of limestone .....	8 "	
38.	Light colored slate.....	10 "	
39.	Sandstone.....	16 "	
40.	Dark colored slate .....	43 "	
41.	Black slate with carbonate of iron.....	0 "	6 "
42.	Coal.....	0 "	1½ "
43.	Clay shale with sulphite of iron.....	3 "	
44.	Soft stratified rock, a mixture of limestone, kidney ore and fire clay.....	11 "	
45.	Sandstone with sulphite of iron.....	1 foot.	
46.	Deep black slate.....	1 "	
47.	Fire clay.....	1 "	6 "
48.	Gray limestone.....	2 feet.	
49.	Variegated shale.....	8 "	
50.	Coal.....	2 "	
51.	Marble limestone.....	8 "	
52.	Blue shale.....	2 "	

53. Gray limestone.....	4 feet	6 inches.
54. Black shale.....	2 "	6 "
55. Gray limestone.....	4 "	
56. Black shale.....	12 "	
57. Blue limestone.....	7 "	
58. Bituminous shale.....	2 "	6½ "
59. Coal (bottom of shaft 276 feet).....	7 "	
60. Sump, fire clay.....	10 "	
61. Sand, shale and lime mixed.....	3 "	
62. Lime shale.....	1 foot	2 "
63. Coal and slate.....	0 "	4 "
64. Clay shale.....	62 feet	6 "
65. Black slate.....	5 "	
66. Coal.....	2 "	2 "
67. Dark clay shale.....	2 "	10 "
68. Limestone.....	1 foot	4 "
69. Clay shale.....	11 feet	8 "
70. Gray slate.....	7 "	
71. Sandy shale.....	14 "	
72. Clay shale.....	3 "	3 "
73. Black slate.....	0 "	9 "
74. Coal.....	1 foot	3 "
75. Soft brown fire clay.....	3 feet	9 "
76. Conglomerate limestone and shale.....	1 foot.	
77. Sandy shale.....	9 feet.	
78. Dark clay shale.....	4 "	
79. Black slate.....	0 "	8 "
80. Coal.....	0 "	4 "
81. Gray shale.....	1 foot.	
82. Coal.....	0 feet	1 inch.
83. Sandy shale.....	5 "	11 inches.
84. Dark shale.....	2 "	
85. Black slate.....	1 foot	2 "
86. Coal.....	1 "	3 "
87. Gray shale.....	1 "	7 "
88. Sandy shale.....	4 feet.	
89. Gray shale with limestone partings.....	3 "	6 "
90. Coal.....	0 "	6 "
91. Gray sandstone.....	5 "	
92. Sandy shale.....	2 "	
93. Clay shale.....	3 "	6 "
94. Coal.....	0 "	6 "
95. Fire clay.....	3 "	
96. Clay shale.....	2 "	

97.	Black slate.....	1 foot	3 inches.
98.	Coal.....	1 "	3 "
99.	Brown clay shale.....	4 feet	6 "
100.	White fire clay.....	1 foot.	
101.	Fire clay.....	3 feet	6 "
102.	Limestone.....	1 foot	6 "
103.	Clay shale.....	2 feet.	
104.	Black slate.....	1 foot	7 "
105.	Coal.....	6 feet	11 "
106.	Dark shale.....	1 foot	6 "
107.	Sandy shale.....	14 feet.	
108.	Sandstone.....	16 "	
109.	Gray shale.....	4 "	
110.	Clay shale.....	25 "	6 "
111.	Conglomerate of sand and boulders.....	6 "	6 "
112.	Sandy shale.....	2 "	
113.	Clay shale.....	12 "	8 "
114.	Coal.....	0 "	4 "
115.	Fire clay.....	0 "	2 "
116.	Clay shale.....	3 "	7 "
117.	Sandstone.....	18 "	3 "
Total depth.....		886 feet.	

## SECTION XLVIII.

## Log of Pittenger &amp; Davis' coal shaft at Centralia, Ill.

1.	Hard pan.....	3 feet.	
2.	Red clay.....	10 "	
3.	Red clay and gravel.....	2 "	
4.	Blue clay.....	10 "	
5.	Clay shale.....	5 "	
6.	Coal.....	0 "	10 inches.
7.	Fire clay.....	2 "	6 "
8.	Blue shale.....	8 "	
9.	Blue limestone.....	2 "	6 "
10.	Blue shale.....	6 "	
11.	Limestone.....	0 "	6 "
12.	Fire clay.....	2 "	6 "
13.	Sandy shale.....	6 "	
14.	Blue shale.....	50 "	
15.	Limestone.....	6 "	8 "
16.	Coal.....	0 "	8 "

17. Fire clay.....	5 feet.		
18. Blue shale.....	50 "		
19. Sandy shale.....	10 "		
20. Sandstone.....	75 "		
21. Blue shale.....	5 "		
22. Limestone (Shoal creek).....	10 "		
23. Black slate.....	3 "		
24. Coal.....	0 "	6 inches.	
25. Fire clay.....	2 "	6 "	
26. Clay shale.....	6 "		
27. Blue shale.....	53 "		
28. Conglomerate limestone.....	1 "	6 "	
29. Black shale.....	3 feet.		
30. Limestone.....	0 "	6 "	
31. Fire clay.....	2 "	6 "	
32. Fire clay and boulders.....	4 "		
33. Sandy shale.....	4 "		
34. Clay shale.....	6 "		
35. Sandy shale.....	10 "		
36. Blue shale.....	78 "	6 "	
37. Coal.....	1 foot	2 "	
38. Fire clay.....	1 "	8 "	
39. Conglomerate rock.....	2 feet.		
40. Sandstone.....	2 "		
41. Clay shale.....	1 foot	6 "	
42. Limestone.....	1 "		
43. Blue shale.....	10 feet.		
44. Sandstone.....	36 "		
45. Blue shale.....	4 "		
46. Sandy shale.....	2 "		
47. Sandstone, with carbonate of iron.....	14 "		
48. Sandy shale.....	5 "		
49. Dark colored shale.....	37 "		
50. Fire clay.....	1 "	6 "	
51. Conglomerate rock.....	1 "	6 "	
52. Clay shale.....	8 "		
53. Black shale.....	0 "	6 "	
54. Red fire clay.....	6 "		
55. Conglomerate rock.....	1 "	6 "	
56. Gray limestone.....	5 "		
57. Shale.....	3 "		
58. Variegated shale.....	1 "	6 "	
59. Fire clay.....	4 "		
60. Dark colored shale.....	5 "		

61. Coal .....	3 feet	4 feet.
62. Fire clay .....	1 "	3 "
63. Limestone .....	5 "	
64. Shale .....	1 "	6 "
65. Gray limestone .....	2 "	6 "
66. Blue shale .....	3 "	
67. Gray limestone .....	1 "	8 "
68. Blue shale .....	0 "	8 "
69. Coal .....	0 "	2 "
70. Black rock .....	12 "	
71. Dark blue rock .....	3 "	
72. Black shale .....	1 "	8 "
73. Coal .....	6 "	4 "
74. Sandstone not penetrated.....	—	—
Total depth .....	637 feet	6 inch.

## SECTION XLIX.

Boring at Highland, Madison county, Ill., for the Highland Prospecting Co. Data kindly furnished by Mr. George Roth.

1. Soil and drift .....	66 feet.	
2. Limestone .....	4 "	6 inches.
3. Black slate .....	3 "	
4. Fire clay .....	7 "	
5. Clay shale .....	16 "	6 "
6. Black shale .....	6 "	
7. Brown limestone .....	28 "	
8. Shale .....	55 "	
9. Sandstone .....	73 "	
10. Blue clay shale .....	10 "	
11. Fire clay .....	10 "	
12. Red rock .....	2 "	
13. Limestone .....	22 "	
14. Shale .....	5 "	
15. Sandstone .....	12 "	
16. Shale .....	12 "	6 "
17. Sandstone .....	6 "	
18. Shale .....	20 "	
19. Sandstone .....	39 "	
20. Shale .....	20 "	
21. Sandstone .....	40 "	

22.	Black shale .....	6 feet.	
23.	Sandstone .....	6 "	
24.	Black shale.....	35 "	
25.	Coal .....	1 foot 10 inches.	
26.	Fire clay.....	10 feet.	
27.	Shell sandstone.....	5 "	
28.	Coal .....	1 foot 2 "	
29.	Fire clay.....	4 feet 6 "	
30.	Black shale .....	55 "	
31.	Sandstone .....	25 "	
32.	Black shale .....	25 "	
33.	Shale .....	75 "	
34.	Limestone.....	4 "	
35.	Shale .....	30 "	
36.	Sandstone .....	29 "	
37.	Shale .....	27 "	
38.	Brown limestone.....	6 "	
39.	Shale.....	4 "	
40.	Limestone .....	8 "	
41.	Red stone.....	2 "	
42.	Shale .....	4 "	
43.	Sandstone.....	8 "	
44.	Shale .....	3 "	
45.	Brown sandstone.....	20 "	
46.	Red stone .....	12 "	
47.	Shale .....	6 "	
48.	Brown sandstone .....	19 "	
49.	Green sandy shale .....	15 "	
50.	Green sandstone .....	18 "	
51.	White sandstone.....	92 "	6 "
52.	Limestone .....	75 "	
Total depth.....		1089 feet	0 inches.





DEPARTMENTS OF GEOLOGY AND ARCHAEOLOGY.



## ARCHÆOLOGY.

BY PROF. WM. MCADAMS.

**T**HE Stone Age in the region now occupied by the State of Illinois began long ages ago. There seems to be some evidence, possibly, of indigenous man who inhabited caves and cliff shelters about our rivers and streams. At least there seems to have been a very primitive people but little above the wild beasts with which they fought for the possession of these shelters,



Cave Men fighting for their Homes.

Their bones are found buried together in the debris of ages ago. What the weapons of these early people were, we can only conjecture, may be only a stone or the portion of the branch of a tree. Accident, or perhaps the

dim promptings of some brighter savage mind may have brought the two together, and the branch was fastened to the stone.

It is singular that primitive man all over the world should have used similar weapons.

The spear followed the stone axe, and in course of time came the bow and arrows. Of course from the beginning to the end of the Stone Age there was great improvement from the very rude to the more finished specimens.

In order that the student may have a comprehensive view of the Stone Age of Illinois, he must understand that the age was a very long one, probably several thousand years, and that in all this time smelting was unknown here, and no metal was used except a comparatively small quantity of native copper.

But the objects manufactured from stone in the region of Illinois were so varied, and had such a wide range of application, that we think there is not another place in the world that can show such a variety of forms. From the more primitive and rude of our specimens to the more elaborate productions of our Stone Age is a long way, and perhaps no people went farther, for we are able to show from the mounds of our State as fine, polished, chipped stone implements as we have seen from Europe.

In preparing the Archæological Collection for the World's Columbian Exposition, we were allowed by the Commission ample opportunity to visit different parts of the State to observe and study various private collections. From some of these collections we obtained, by purchase or otherwise, some very choice objects. We also made an interesting series of photographs of these collections. We also had opportunity to do some exploring in the mounds. A selection from these, as well as from those we had collected for the State in previous years, made one of the choicest and most representative collections we have ever seen exhibited.

In our history and description of the objects in the State exhibit in the beautiful cases in the Illinois Building at the World's Columbian Exposition, we may digress occasionally for the sake of comparison or analogy, as well as for suggestions germane to the subject. We shall do this with a confidence which more than thirty years' work in field-investigations has given us.

### Stone Objects Used as Tools.

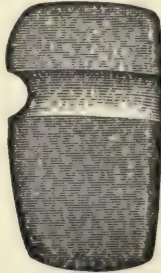
The Stone Age of Illinois is represented by a great variety of forms both in flint and granitic rocks that were used as tools and not as weapons. One of the most common of the ancient tools is the grooved axe. Of these there are a great variety of forms, especially in the valley of the Illinois river. One of the most common of these is shown in the engraving.



Grooved Stone Axe.

They were evidently designed to chop with the sharpened edge as well as to use the poll or rounded end for hammering. They are made mostly of some varieties of granite found among the drift rocks so very plentiful in the glacial deposits of central and northern Illinois. No doubt a stone was selected from the drift gravels as near as could be found of the right shape, and the edge as well as the groove and pattern of the implement was formed by a continued and persistent picking with the point of another hard stone. Many times we have found these axes plainly showing the pick marks. Often one is found that shows that it had been broken and it has been repaired or formed in a new shape by picking. Sometimes one is seen that had been used until it was quite smooth and the edge quite blunt and fresh pick-marks on the smooth surface plainly show it was undergoing a change in shape.

Another very common form has one side of the instrument made straight, and this edge is often slightly hollowed out so as to fit up against the end of the haft.



Grooved Stone Axe.

Oftentimes this form is made with great care and nicety, out of the most obdurate greenstone or some of the dioritic granites. Some of the finest grooved axes we have seen are of this form. One of granite in the State Collection is most excellently fashioned and weighs

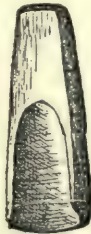
about sixteen pounds. We saw another splendid axe of this form that weighed twenty-three pounds—it is sixteen inches long and nine inches wide—it is also of granite. Both specimens were found on the bank of the Illinois river near Peoria. We had in our possession still another fine axe of this form, nearly the same size of the preceding, but the sides both above and below the groove were nicely hollowed out so as to be quite thin. It weighs about fifteen pounds, is of granite, and was found on the bank of the Mississippi in Madison county, near Alton. This is the finest grooved axe we have seen.

In the State Collection is an excellent grooved axe of this form made of hematite. This beautiful specimen, which was found in Calhoun county, is polished over its entire surface. It weighs twelve pounds.

It is not uncommon to find axes made of iron ore.

Another form of grooved axe, of which we have seen several in the State, has an extremely long bit like a more modern, but obsolete, post axe for making a mortise. They are rare.

Still other forms of grooved axes found in the State are flat on one side like an adz, and we have seen a few with the bit hollowed out like a gouge.



Stone Gouge.

Ordinarily, the grooved axes weigh five or six pounds, but some are very much larger and some much smaller.

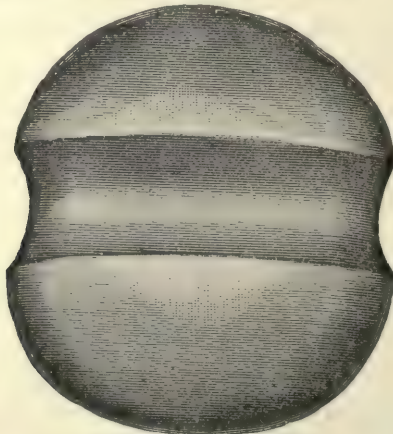
As before remarked, I am inclined to think none of them were weapons.

Besides what are termed axes, there are several varieties of grooved implements known as hammer stones. In some of them the groove is lengthwise, but in most of the specimens it is lateral. Along the Illinois river we have found a number of large grooved stones, oval in shape and weighing fifteen or twenty pounds. These are generally called anchors and were possibly used in fishing.



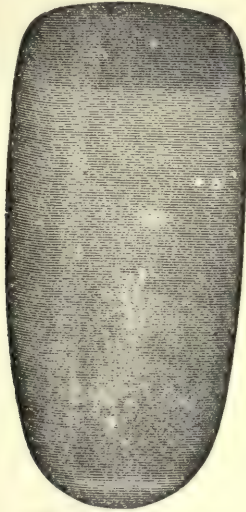
Hafted Weapon.

Among the grooved stones is another form, generally nearly as large as a goose egg, which was possibly anciently used as the head of a weapon. They were generally made with much nicety and frequently of quartzite. Near the mouth of the Illinois river in Jersey and Calhoun counties, where quartz geodes are numerous, we have seen hundreds of these balls, some grooved, others not, that have been worked out of solid geodes.



Grooved Hammer Stones.

We have seen a few stone axes with the groove in the middle, and a bit or edge on both ends. One of these from Jersey county was a most beautiful stone implement, and had probably been a weapon. They are not common, and we have seen less than a dozen in the State. Besides the grooved implements there is a large variety of axes and implements without grooves.



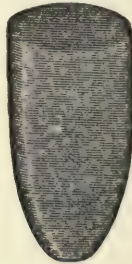
Celt, or ungrooved Axe.

The ungrooved axe is known generally as a celt. The celt is very common in Illinois. They were probably used by being inserted in a club or handle. Some of these were doubtless weapons, but many were tools for various purposes. Most of the celts, like the grooved axes, were made from glacial pebbles and rocks found in the beds of streams. They are mostly of granitic rocks and rarely of quartzite. Some of the larger specimens are made with great nicety, and very many of the smaller ones are nicely shaped. Most of them were probably made by the picking process. In fact we have had a num-

ber of specimens in which the pick marks still remain as though purposely left as far as the object was to be inserted in the handle. In the State Collection are some fine specimens of Illinois celts.

In the great "American Bottom" there is common a peculiar form of very large celt, often weighing fifteen pounds or more, that has a blunt edge as though it had been used in the manner of a pestle. A few of these large celts are found along the Illinois river. One fine specimen shown at the World's Columbian Exposition we obtained near Peoria. Two other large specimens in the State Collection were found on the bank of Cahokia creek, in Madison county. It is not uncommon to find small celts made of hematite along the Illinois river.

In the collection was one fine celt of quartzite, and we have seen a few others all from the Illinois river. They have been made with great labor, and must have been highly prized. One of these exquisitely wrought quartzite celts we took from an ancient mound in Calhoun county. They possibly all belonged to the ancient mound-builders.



Celt.

There is another form of celt or battle axe that was first chipped from a choice piece of flint or chert, and then the chipping scars or marks all ground off, making a polished flint implement of exquisite beauty. One of these we took from an ancient mound in Jersey county.

It was eleven inches long. Another we took from a mound in Madison county. All we have seen were taken from mounds in Illinois.



Ground Flint Battle Axe.

Another rare form of these battle axes as shown in the State Collection at the Fair, is made of a variety of black diorite or horn-blendic granite, and paddle-shaped, with a long handle. We took these from ancient mounds in Madison, Jersey and Woodford counties, in Illinois. One of these splendid stone implements was over a foot in length, and the others but little shorter. We have seen none of these, except from Illinois. These implements belong to the older mounds, but not from the same class of mounds to which the grooved flint celts belong.

Both the grooved axes and celts of Illinois differ materially from those found in the Eastern States,—and in any large collection from Illinois, one can easily separate types that quite possibly belong to different peoples that have succeeded each other in course of time. So also do the stone axes of Illinois differ from those of Mexico, as well as from those of the cliff-dwellers and Pueblos. It might be remarked, too, that they differ from the stone axes of Europe, especially from those of Northern Europe. We have no perforated stone axes

like those of Sweden and Denmark. We have never yet seen in the Mississippi valley, or in the United States, any of the peculiar type of the stone axe of the Vikings or Northern Sea Rovers.



Perforated Ceremonial Stone Object.

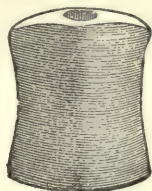
While we have no representative of the European perforated stone axe, we have a numerous class of drilled and perforated ceremonial stones that can, however, hardly be classed as weapons. Whether our later Indians used any of these ceremonial stones we have little evidence. They nearly all belonged, quite possibly, to the older mound-building races. These beautiful relics are, for the most part finely and symmetrically shaped and well polished. They were too small to have been weapons, and were doubtless made with great labor and almost inconceivable patience, for some sort of ceremonial purpose.



Ceremonial Stone.

In the State Display at the Fair were a number of these objects of pink quartzite that were very gems of the strange productions of the stone age. While the greater part of the finer of these objects are of quartzite,

some are made of a striped or variegated slate. That anybody without tools could simply grind and rub down a piece of such obdurate stone as quartzite or jasper into a symmetrically formed object of a known design, is remarkable chiefly as showing their patience as well as skill. Time, of course, was without limit. That they should drill holes in these hard objects is not so remark-



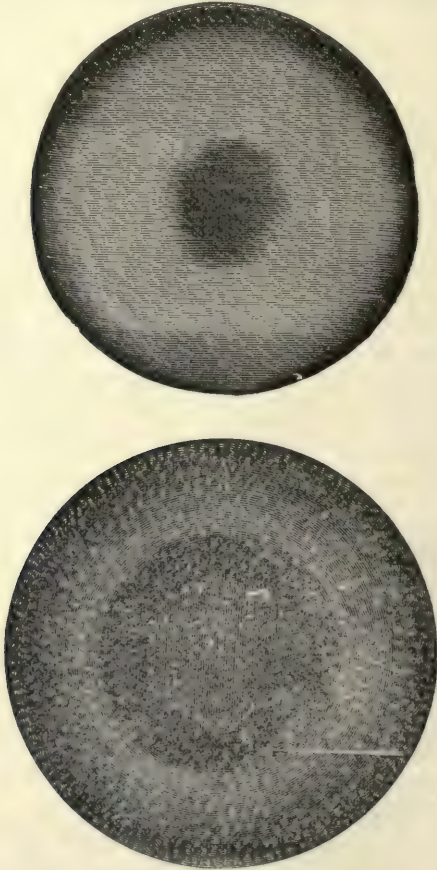
Perforated Ceremonial Stone.

able as is the working them into shape. One might take a reed or hollow cane, and with sand and water by continual turning, make an impression on almost any stone except the diamond.

The incentive to manufacture these objects is, of course, unknown to us, but must have been a most powerful one. Possibly they were carried to designate some peculiar position the wearer held in the tribe or nation. They may have had a religious significance, for it seems to be well established that some of the mound building races had very much better and more definitely organized religious ideas than have our modern Indian. At any rate these peculiar ceremonial stones stand today as the highest examples of stone carving, or rather of stone working, of the ancient inhabitants of this region, or of the continent.

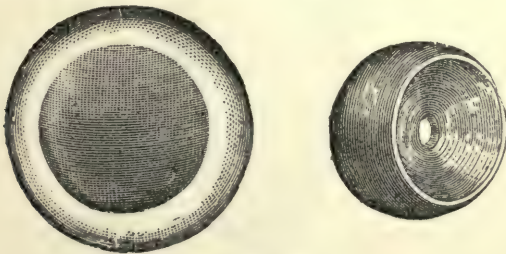
Another class of stone objects very common in Illinois, and of which there was a splendid assortment in the State Display, are the discoidal stones and the objects of kindred shape. They have been made of many varieties of

rock, and we have seen a few of baked clay, but they are most commonly made of the same glacial granites of which the axes are formed. Occasionally one is seen of quartzite, and we have collected a few of pure quartz. In these objects there is a great variety of forms and sizes. The common form, however, is a disk with depressed sides.



Discoida.

The most of these discs have been made with a great amount of labor, especially those from the granite and quartzite rocks. They are more common in Illinois than perhaps in any other region. We have had as many as a hundred at a time. There has been much discussion as to their uses, and we may as well admit that the purpose for which they were made is unknown to us. There is a very large and peculiar variety found in Tennessee and other Southern States that is thought to have been used to play some kind of game; but the great majority of those found in Illinois are much smaller and so different from those from Tennessee, that the idea of their being gaming stones has been abandoned. They have been called medicine-stones or cups in which medicines have been mixed, but still we have many fine specimens that have a perforation in which the two depressions are joined. Some of those from Illinois are exquisitely made of granite, quartz or jasper. We have seen a number that were no larger in circumference than some of our small silver coins, and those the size of a silver dollar are quite common. On several occasions we have found them in mounds, and generally in pairs of opposite colors. Several were shown in the Illinois collection that had in the center of the depression, deeply carved on both



Discoids.

sides, the figure of a cross, thus, (X). Those thus figured were made of white limestone, and were found buried in the mound with the remains of children.

It may be well to remark that we have never found a discoidal stone in any of the more ancient mounds, nor in the mounds of the Cahokia type. They are not uncommon, however, in the mounds of later date along the Illinois river.

Why the ancient stone-workers should not have made discoids out of hematite, which was so common, and which would have made such fine ones, is a question which has occurred to us.

#### **Plummets and Pendants.**

There is another class of stone objects very common in Illinois, and of which we had a fine assortment in our State Exhibit, which are called plummets or pendants.



Like the discoids, there has been much discussion as to the uses of these objects. They are plentiful in the Illinois river valley. They are usually from two to three

or four inches in length, and pear-shaped, some having a crease about the smaller end, or sometimes a perforation. They are mostly made of hematite, and these are generally the most artistic in finish; but we have found them made of granite, quartzite and of limestone. What the ancient people did with these objects we cannot even conjecture, but of one thing we are certain, they put oftentimes a great amount of labor on their manufacture. Many of those of hematite were elegantly shaped and highly polished. Many of these pendants had a slight crease about the smaller end, as if for suspension, but nearly always the depression was so slight that one was inclined to wonder what kind of a thread that would go in so small a crease would suspend such a heavy object. But perhaps they were not suspended. Other specimens have a perforation at the smaller end. While the majority of these objects are of hematite, there are many others along the Illinois river of various kinds of stone. We



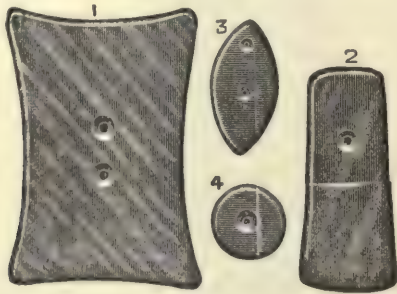
Perforated Pendant.

have collected some made of granite. One especially nice one of granite, about five inches long with a perforation at the smaller end, we found near some ancient mounds of the Ohio type, on the Illinois river.

One beautiful specimen of these perforated plummets, made apparently of quartz crystal, was taken from a mound of the Cahokia group. In this mound was also a perforated tube made from a large quartz crystal that still had some of the six-sided faces upon it that quartz crystals have. But for this we might have committed the very grave error of pronouncing the specimen to have been made of glass. We have never found a hematite plummet in the mounds we class as very ancient. They are not uncommon in the mounds along the Illinois river.

In a large mound at the mouth of the Illinois river we examined a number of plummet-like stones of limestone, with a crease about the smaller end, that were square at the base and pointed like a pyramid. They were made of white limestone, had been polished and were about three inches long. All our theories in regard to the use of these plummets or pendants we have finally discarded as unsatisfactory.

Besides the plummet-shaped objects, there were many other objects of stone with one or more perforations for



suspension or attachment to the person or dress. These are often found, like the axes and other stone implements, in the fields where the plow turns them to the surface. There is a common type in a sort of tablet shape.

After much discussion it is not satisfactorily settled among antiquarians whether these objects were tools to use in the manufacture of something, or whether they were simply ornaments. There is in the State Collection several of these perforated objects made of a sort of striped slate, and quite attractive as aboriginal objects of stone. These objects are not nearly so plentifully found in Illinois as in Indiana and Ohio. Almost every collection in Indiana contains some of these objects of striped slate. We have not found them in any of our ancient mounds.

One curious form of objects of this class found quite often in Ohio and Indiana, but very rarely in Illinois, is a sort of hollowed-out stone, somewhat like a miniature boat.



These have near each end a perforation as though for the purpose of attachment. We have seen but few of these in Illinois and all were found along the Illinois river. Those shown in the State Exhibit were found along the Mississippi bluff in Madison county.

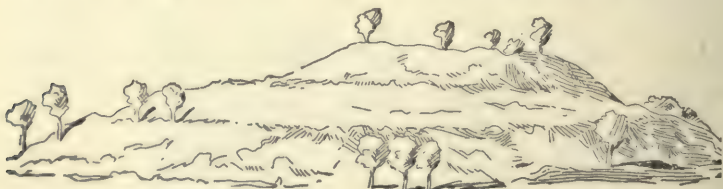
Another form of stone implements quite common to Illinois, and of which some fine specimens were shown in the State Exhibit at the World's Columbian Exhibition, were mortars and pestles. The depression in many of these mortars is shallow and not very large, and quite often the stone, which is usually an oblong, glacial boulder flattened on two sides, will contain a depression on either side. We have never found in Illinois any mortars worked out in the shape of a bowl, like those from California, about Los Angeles and elsewhere.

Pestles are common, but in many instances so much more elaborately made than the stone mortars that it is possible that wooden mortars were used, or a natural depression in ledge or ledge rock taken advantage of.

Along the bluffs of the Mississippi, in Madison county, we have found some fine pestles all made of limestone, and generally a foot or more in length and three or four inches in diameter.



Some of these long pestles are made very round and true with much care and labor. The common pestle, so familiar as a relic in Ohio, with a short hand-hold and a wide, flaring base, is very rare in the State of Illinois.



A large Mound in the American Bottom, Madison County, Ill.

Under the head of pestles or rubstones might possibly be classed a form in the shape of a very short cone, with a flat base. We have found numbers of these on the Illinois river. They are usually made of hematite and are symmetrically made and highly polished. They are generally called rubstones. We have seen numbers of them made of other hard stones besides iron ore.

Quite a variety of relics of stone are met with that from their remarkably smooth appearance would suggest their being used as rubbing stones. Still others have been made for purposes now not known.

Occasionally one finds a curious tube made of stone. Some of these tubes are doubtless pipes. One of the finest pipes we have seen in Illinois, with the figure of a bird carved upon it, is simply a tube.

There are other tube-shaped objects not uncommon that were used most probably in some part of observances either of a religious character or by the medicine men. One of the prettiest objects, and which we placed in the latter class, we obtained under the bluff in the vicinity of the Great Cahokia Mound. It was a tube some four inches long and flattened on one side. It was found in one of the mounds near by. When we first saw it we thought it to be of glass, and of course of modern manufacture, but on closer examination we discovered it to be made out of quartz crystal and the original faces of the crystal could still be traced near one end. The hole bored through this crystal was about three-quarters of an inch in diameter. From a mound on the Illinois river we took another tube-shaped object made of gypsum,—the hole through this, however, was tapering and we always thought it to be some kind of pipe.

### Pipes.

There is no class of objects of ancient production more interesting than the aboriginal pipes.

It would seem that all the skill and ingenuity in stone carving among the ancient people of Illinois are shown in the manufacture of their pipes. We call them pipes because we think they smoked them, but I have doubts if any of these objects were ever used as we use a pipe for the narcotic influence of tobacco. We have taken

many pipes from mounds and handled many scores of others from mounds, but have yet to see a real mound pipe that seemed to show any evidence of much use, in the way of tooth marks or wear in the bowl such as one of our modern types exhibits after any extended use. Those from the mounds generally have a new appearance, even to the markings in the boring of the cavity for the bowl. It is possible, it is true, that new pipes might have been buried with the body of the departed, but in the surface finds we have failed to see an ancient pipe with a burned and worn bowl. In the very fine collection of ancient pipes in the Illinois Exhibit not one showed much sign of continued use in any way. We are inclined to think the ancient pipe was simply an object to perform religious ceremony by making smoke which was connected with some worship, fire and smoke being representative of their divinity. Pipes, we believe, more than any other stone implements, are typical of the people who used them.

In the State Exhibit were four good stone pipes taken by us from a large mound on the Illinois river. In the mound was a great number of skeletons, but we would have been greatly surprised if we had found in that mound a single curved base pipe like those of Ohio. Yet in the same vicinity on the bank of the Illinois, we explored another large mound and in the basin of burned clay we found a pipe of the type we expected to see, almost exactly like those found by Morehead in the Hopewell mound.

There are several types of mounds in Illinois, but there are more types of pipes, because there are some types of pipes that were made and used by people who did not make mounds, and others by people who did not follow the custom of placing such things in the grave.

The finest pipes in Illinois of ancient patterns are those of the curved base. One of these taken from a mound on the Illinois river represents a raccoon sitting on the base of the pipe.



Mound Pipe.

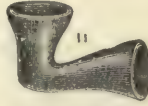
A hole in the animal's back represents the bowl, which is connected with the small hole through the base to form the stem. The figure of the animal is very spirited, the holes for the eyes being filled with with a globule of of white metal, probably native silver. The rings on the raccoon's tail were well delineated. The pipe was smooth and polished, made of a piece of red catlinite and between three and four inches long. Another and larger pipe of the same material and from the same vicinity was made to represent an eagle standing in an attitude of pride on the base which formed the stem. Another beautiful pipe we took from a mound had the figure of a turtle resting on the bowl, and in still another the bowl of the pipe was made to represent a frog. Another fine pipe from a mound on the bank of the Mississippi had carved in bold relief on the top of the base the life-sized figure of a lizard. A few we have seen had for a bowl a representation of a human head.



Curved Base Pipe to be Used Without a Stem.

And it is worthy of remark that in all the delineations of the human head we have seen from this class of ancient mounds, there is a head dress quite unlike any

costumes of our modern Indians. The mound builders' head dress was arranged in folds of some fabric.



Mound Pipe.

The bowls in all these beautiful and artistic pipes are very small, and as before remarked, show no signs of use. They were doubtless used, however, in some sort of ceremony by the owner. Nor were the ancient pipes made to use with a stem, this was formed by the base of the object and the perforated end of the base was placed between the lips.

The mounds from which these pipes were taken seem to be related to those of Ohio with which the earthworks and enclosures are connected. A colony of this ancient people seems to have extended up the Illinois, possibly some distance above Peoria, as we have seen one of their mounds in the bottom some miles above that city. And there were also colonies of these people on the Mississippi, but not near the northern end of the State; we have seen no signs of them in either Iowa or Wisconsin. The great city and center of population of that age was in Madison and St. Clair counties in the "American Bottom" on the Mississippi river. We shall speak of them farther on in our description of their agricultural implements, for they seem to have been decidedly a people with fixed abodes and devoted to agriculture.

The second class of pipes is of very great interest, more, perhaps, on account of their elaborate carving, however, is very different from the preceding. They are very large and probably on this account have been called "Calumet Pipes" by the Smithsonian savants. These large stone

pipes were smoked with a large stem if one was used, and were made to represent birds, mammals, amphibians and sometimes the human figure.



Mound Pipe.

They were probably pipes of ceremony on great or important occasions. Some of the most beautiful pipes of this class we have ever seen were in our exhibit at the World's Fair.

One was the figure of a bird, possibly an eagle or a hawk, for it had a hooked bill. It was eight or nine inches in height and boldly carved from a piece of black stone, probably a variety of steatite.

One peculiarity of this splendid pipe was that the bowl was a straight tube, the perforation contracting in the middle, the lower part being used evidently for the insertion of a stem. With this pipe was found another somewhat longer, but without ornament, and of the same material. The perforation in this also was contracted to a small aperture in the middle of the tube. These pipes were plowed up together in a field in southern Illinois. We obtained a contracted tube pipe somewhat like the latter, but smaller, in Calhoun county, and have seen a few others found in the vicinity of Peoria, on the Illinois river.



Mound Pipes.

Another fine and very large pipe shown in the State Collection was also from the southern part of the State. It also seemed an attempt to represent some bird. It was more than a foot in length and made of some hard light colored stone.

Since we have found none of these peculiar forms of pipes in any of our mounds we are inclined to think them comparatively modern, and used by the later grave-making people and not connected with the mound building nations.

There is another class of pipes found in considerable numbers in Illinois that are of exceedingly great interest. They have been called ceremonial pipes and are sometimes of large size and show considerable skill in the carving. Some splendid specimens of this type were shown in the State Collection. One of the most interesting of these is the representation of the human figure in a crouching attitude not very unlike the sphinx in Egypt. The face is not a bad one and it is interesting to note the attempt to portray a head dress, evidently of some fabric. The figure holds in its right hand a sort of mace, or implement terminated by a round knob or ball. Two funnel shaped holes, one extending down-

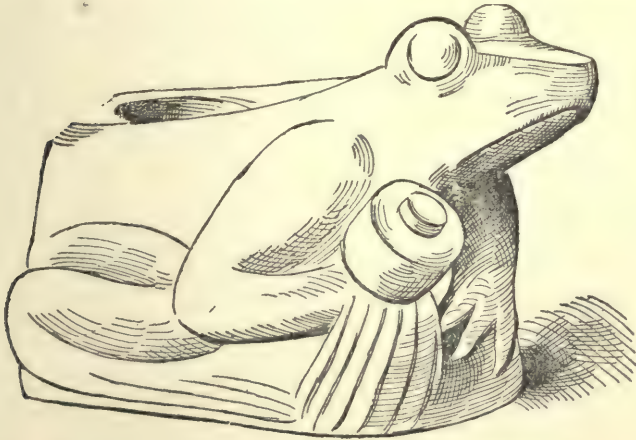


Sphinx Pipe from Mound.

wards from the back and the other inwards from the posterior parts meet at their smaller ends. The upper hole is supposed to be the bowl of the pipe. This is the

best specimen of this type of pipe we have seen in the United States. It is beautifully carved from a block of red catlinite, and stands somewhat over eight inches high.

It was found in a small grave mound, if mound it might be called, for it was more of a rock covered grave than a mound, on a branch of the Piasa creek in Macoupin county. In the same grave was a most elaborate piece of pottery, and a very large flint spear head. Another most elaborately carved and beautiful pipe of this type we found ourselves in a very small mound or rather a simple burying place but a few inches below the surrounding surface, on top of the bluff east of the Great Cahokia Mound. The object is in the shape of a huge frog, being some eight inches or more in height. The position of the animal is one of rest. The legs and feet are



well delineated, the eyes projecting and full, and the general appearance of the object quite spirited. As in the preceding pipe, the right hand holds a sort of mace or knobbed instrument evidently some sort of symbol indicative of position or other meaning.

This remarkable pipe is also carved from a piece of red catlinite and buried with it were some splendid pottery vessels and ornaments of shell and copper. Some of the ornaments had first been made of wood and then covered with copper.

On the bank of the Mississippi in an ancient burying place covered with huge flat rocks, we found another one of those sphinx pipes representing the crouching form of a man holding with both hands on its knees what seems to be the figure of a fish. From the wide open mouth protrudes what seems to be another fish. It is also of red catlinite and the carving very fine. It is not quite so large as the frog pipe just described. This singular pipe is the nearest approach to some sort of idol or divinity we have observed among these so-called pipes.

In Calhoun county, which is remarkable for the number and variety of its relics, we have found quite a number of these large frog pipes. But few of them are made of catlinite. Some are of limestone and we have seen a few of sandstone. We are inclined to think they belonged to some of the more recent nations or tribes who have inhabited the vicinity. We do not know of one of these pipes having been found in one of our typical mounds or those related to Cahokia or the Ohio earthworks. One thing peculiar in these pipes is the manner in which the stem was fitted on them, if indeed they were smoked with a stem. The aperture for the stem is a single short funnel-shaped hole, usually the same size as the bowl. How a stem could be made to stay in its place we cannot conceive.

There is another type of pipe more common than any we have yet described. These are mostly made of stone and sometimes show excellent workmanship. Occasionally one is found of baked clay. They are all made to

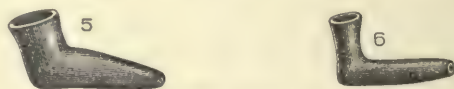
be smoked with a small stem. There is a great variety of shapes; many were simply a bowl like our cob pipes, while others had a projecting base. Some are made of baked clay. Some are of catlinite and many of limestone. We have never seen a pipe made of any of the



granite rocks or any very hard material. Nor did we ever see a copper pipe nor any of metal, except a modern one. Neither have we found in any of the mounds or ancient graves any sign of a wooden pipe, nor a pipe of bone. There are in the southern part of the State, among the graves of the pottery-making tribes, many pipes of pottery, mostly of rude character, that have the same peculiar funnel-shaped cavities for both bowl and stem. These are seldom, if ever, seen on the Illinois river. The same question arises, how did the smokers make the stem stay in the funnel-shaped aperture?

Many of the pipes just described are found in graves, and mounds that contain them are abundant along the Illinois river. In one large mound on the bluff several miles above the mouth of the Illinois river, in Jersey county, we found several of these pipes shown in the State Exhibit. The mound was nearly a hundred feet in length at the base, and nearly forty broad, and nearly twelve feet high. The material of which the mound was composed was the light buff colored, marly clay called loess and not hard to dig, although where it is below the reach of the rains, it is very dry and compact. It was a burial mound and had evidently been made through a succession of interments. We judged that perhaps a hundred or more bodies had at different times been deposited there. The greater number of the remains were

about the sides of the structure, as though a body had been laid down without any apparent form or special position, and covered over with several feet of earth. There were men, women and children, and many of them had met violent deaths, some having been tomahawked and others killed with arrows. Quite a number of them had worn ornaments of sea shells, and fine strings of these were about the remains of both men and women, and even some children. There were a few stone implements and a number of pipes of the type we have just



Mound Pipes.

described and of which there is a considerable number in the State Collection. As this fine mound stood in a cultivated field and the owner wished to level off the land, we witnessed its almost entire demolition, having first photographed it from different sides before its defacement. There was a considerable number of relics which we preserved carefully, including those of the crania, which were sufficiently well preserved, and such as showed wounds or other peculiarities. We derived much information from this mound. There were no signs of copper or any metal, not even ores; no mica or obsidian or objects from a distance, except some small sea shells, to give any indication of commercial relations with other and distant tribes or nations. Not a single pipe or ornament was made of catlinite, and they had a degenerate modern appearance, both in shape and workmanship. There was nothing that might suggest a connection with the people who made the Great Cahokia Mound or the earthworks of Ohio. Still they had a large mound and perhaps held some sort of ceremonies there in remembrance of some still unforgotten religion, either that

of their fathers or of some friendly nation from whom they had learned to revere some sort of divinity. We can even imagine the sadness, the tears and despair as this remnant of the ancient people lit their pipes in sacred reverence around this mound in their death wail. That they had enemies that had slain their wives and children around their firesides was plain enough from the gruesome evidence of the cruel holes the merciless weapons left in the skulls of the women and children. And the remains of some of the men showed plainly how they had fallen. One stalwart young man had a flint arrow head entirely through the center of his backbone and the weapon remained there still. The vertebral cord had been cut asunder. Another skeleton of a middle aged man had in the region of the vital organs no less than six arrow heads.

We were much interested in these arrow points of the enemy, for they were different in shape from those commonly found in the vicinity.

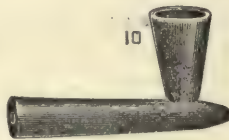


Mound Pipe.

The pipes and other objects found in this mound tell a good story. The once powerful mound-building races of the valley had become, by pestilence or otherwise, but a remnant, may be nearly or entirely extinct and those later mound builders were merely remnants of their allies or subjugated tribes that had learned to follow the customs and religion of a more advanced people. This weak remnant of the mound builders had probably escaped the dire calamity by plague or other scourge that had swept from the face of the earth that wonderful people who had built up the Cahokia, the grandest monument the world has seen.

The burial mound on the Illinois river just described we believe to be modern and among the later erections of the mound building races. But while we thus qualify the time of its erection, it is in fact old enough, for the evidence of the trees in the forest which covered the ground and the decayed stump which still stood on the apex of the mound itself, bore evidence that it was not new, and had been built long before the caravels of Columbus had sought the shores of the New World.

Many of the later aboriginal pipes, either of stone or clay, approach in general character the pipes now common among civilized races, being furnished mostly with necks to which to attach the stem. There are very many modifications in the style of the more modern pipe, but there is almost always discoverable the type form.



There is another form of pipe found in Illinois, mostly along the Illinois river. This pipe seems to have been made to be used by more than one person at the same time. There is a large, round bowl with four, five or six places to insert stems.

One very pretty pipe of this kind we obtained in Calhoun county and another one from Woodford county, above Peoria. These were both of burned clay. But we have a very nice one of sandstone from Randolph county.

One other form of pipe, which is rare, however, and we are done with this most interesting class of relics. This is a pipe in the form of a stone axe.

One very nice one of these we have seen in Dr. Zeller's collection at Spring Bay, near Peoria. Four or five of the Doctor's best relics were obtained for our State Ex-

hibit. Another very nice axe-shaped pipe we saw in the collection of Mr. Harry Mann, at Chester, in Randolph county.

The other we have in our own collection. It was found in Jersey county. The Chester specimen is made of argillaceous stone, perhaps a slate. Our own specimen seems to be of a species of rather hard steatite. These specimens do not look modern, but they may be. It would be interesting to know whether, if they are ancient, they had suggested the iron pipe tomahawks, the handle of which was the stem to a pipe in the poll of the weapon, or whether these stone axe pipes had been suggested by the French iron tomahawk. These stone axe-shaped pipes are small, being not more than three inches long.

#### **Sculptures or Idols.**

Although many of the articles described by us may be called sculptures in view of the manner of their production, in this paper we will confine the sculptures to those objects representing the human form that seemed to be intended for other uses than those of a pipe.

It seems that the mound builders and aborigines had but just begun to make images or representations of the human form that might be called "idols." Very few have been found in the Mississippi valley. A few of these objects now in the Smithsonian collection, have been found in Tennessee.

They are mostly a foot or more in height and have a sitting posture very much like the stone idols from India. As might be expected, these early images are rather rude attempts at sculpture. One of the best specimens of these ancient images we have seen in the United States was found in a mound in southern Illinois and was a prominent object in the State Collection at the World's Fair.

It is something over a foot in height and extremely heavy, weighing nearly fifty pounds. It has been carved from a massive piece of flint. The face, though rather rude, is not a bad one. There is apparently no attempt, as in some of the pipes, to delineate any head-covering or dress of any kind. There is an incised line from the neck down the sides inclosing the back in a sort of scroll. The whole figure is smooth and well finished. The right hand rests on the upright knee.

We have seen idols or images, very similar to this and carved from calcite or a similar stone, from India. Considering the scarcity of these objects among our relics of the stone age, this is an extremely interesting specimen. We have seen a few others, somewhat similar, from Tennessee and that region. They were made of limestone or sandstone. We somehow have the impression that these objects were the work of some medicine man among some of the southern tribes of later date and are comparatively modern.

### Objects of Copper.

During the stone age, copper was introduced among the aborigines and many objects, especially of an ornamental nature, were made of it. It is probable that the age of stone was far advanced, possibly at the very height of the advancement of that era before much use was made of copper.

The copper used was a native metal and not in the form of ore but soft and malleable, yet still they treated it as a stone and knew nothing of smelting.

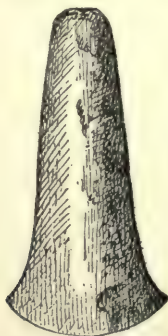
Copper implements such as axes or celts, for the copper axe is never grooved, chisels, knives, and the points of arrows and spears, together with ornaments of various kinds, are found in Illinois. A few of these objects are found on the surface where they evidently have

been lost. The great majority of the copper objects, however, are taken from mounds, where they have either been buried with the dead or in some ceremony.

While we have found copper objects buried with human remains in mounds, the greatest number of these objects we have known were not especially buried with a dead body but seem to have been offered or placed in a great fire built upon a rude altar of clay.

Copper objects of elaborate and beautiful workmanship were quite possibly common among the ancient mound builders who at one time flourished in Illinois and Ohio. Among the later mounds so common along the Illinois river it is rare to find it, although many other ornaments are common. Copper objects have been quite frequently found among the mounds of Wisconsin and Minnesota, but they are, many of them, different in form and lack the finished workmanship of the copper ornaments from Illinois and Ohio.

Among weapons of copper the copper axe or celt was common. It was usually the shape of the stone celt but much thinner. It was doubtless inserted in the war club.



Copper Axe.

One of the finest copper axes we have seen was shown in the State Exhibit. It had evidently been hammered out of a piece no longer than was represented in the

weapon. It could very plainly be seen how the edges had been turned over and beaten down to get the desired shape and neat square edges along the sides. The bit or cutting edge was neatly flared out at the corners. This elegant specimen was nearly a foot in length, and was taken from a mound in Calhoun county. Although we have seen several large specimens in Illinois, the most of them are small, usually not more than three or four inches long. In a large mound in Calhoun county we found lying close together several very small ones not more than two inches long. We thought it possible that several small ones were sometimes fastened in the same weapon. We have never seen a grooved copper axe nor one with a hole in it in which to put the haft. Some copper tools from Wisconsin have a part of the side turned over, to assist in fastening the handle, evidently.

A few knife-shaped objects of copper have been found in the State. One very good specimen of this kind in the collection of Judge James Shaw of Mount Carroll was found along the Illinois river.

Copper needles or long slim tools are not uncommon. Some of them are round, similar to pieces of wire. One of these from a mound in the American Bottom in Madison county is eighteen inches long. Many of these tools are flat and pointed. A fine specimen of this kind, more than a foot in length, is with the preceding one in the State Collection. This specimen shows very plainly how it has been made of two pieces by being hammered together in the middle. It is from a mound in Pike county. In one mound we found over a score of these tools oxidized together in a mass. Occasionally a spear-head of copper is found, some good specimens of these being in the State Collection from the Illinois river as well as some smaller points, probably for arrow heads. I have, however, found no specimen like these in the mounds.

Copper was used by the mound builders more for ornaments than for weapons and tools. They made quite a variety of ornaments, but certain forms seem to have obtained and were followed as strictly as our own more permanent fashions.

A common fashion seems to have been to wear ornaments in the ears. These were nearly all made after a similar pattern, a sort of large button very much like our sleeve buttons. Two disks were joined together with a shaft or shank, mostly hollow.



Copper Ear Buttons.

These hollow shanks were most deftly and neatly fastened to the disks by having the edges turned over and beaten together. Of course, when worn they were doubtless very smooth and bright. In Madison county in some of the mounds of the Cahokia group we have found some of these disks made of bone and covered with a thin sheet of copper. In the State Exhibit were some fine specimens of these bone ear buttons covered with copper. We have found some beautifully neat ones made of both bone and horn, elk and deer antlers, I judged, and the outer and larger disk covered with copper.

In the ashes on the altars in the Hopewell mound in Ohio, Morehead found many hundreds of these ear buttons, made most elaborately, the outer disk in some instances with ornamental figures in relief. In a few instances some of these elegant ornaments had the outer copper disk covered with native silver.

The outer disks of these buttons are generally an inch and a half in diameter, although I have found them two inches or more. Many of those found by Morehead and on exhibition in the Anthropological Building were corroded and oxidized, and some half melted in the mass in the ashes, but very many were entire and one could examine their workmanship and the manner of their manufacture.

The enormous number of these ear ornaments found in the Hopewell mound shows very plainly that ornaments of this kind must have been highly prized and quite commonly worn. We also learn that however highly prized they were, some wonderful occasion arose in which they were taken from the person and cast into the fire at the erection of that great mound.

We would not, in fact, know that the ancient mound builders had any material wealth or had any sort of tastes above the Indian, had made any material advancement above a mere savage, or had any knowledge of the country or anything like commercial relationship. But here were cast into these religious fires on the base of this great mound hundreds and thousands and tens of thousands of beautiful pearls, some of which as we saw them lying in ruins in the ashes, or in piles in the cases, were of a beauty, except for those cruel flames, to have been the envy of Egypt's beautiful queen when she sought with love's prodigality to give Marc Antony the most costly drink ever mortal had, by having her choicest pearl crushed to powder and mixed with his draught of wine. The pearls that were cast into the fire on that memorable day in the history of that people who made the Ohio mound, would, if unscathed by the flame and the burial of centuries, have been the envy of the richest king or queen in the world. With the pearls were the richest obsidian relics the stone age has pro-

duced in such profusion and of such size and beauty, yet obsidian was not to be obtained nearer than the Rocky Mountains or Mexico.

There was copper from Lake Superior, mica from North Carolina, fossil shark teeth from South Carolina, shells from the distant ocean, all things from distant parts of the continent, and very difficult to obtain either by travel or commercial intercourse,—a most remarkable collection for any people of the Stone Age to have, and still more remarkable for them to cast such things into a seething flame. What Indian village, that white man ever knew, contained such a collection of things as were here cast into the flames?

That an ancient people lived in Illinois who had some connection with the copper mines of Lake Superior, and may have worked them, is quite probable, else they had some commercial relations with a people who did get copper there.

Besides the copper ornaments for the ears, there were many others. A not uncommon ornament seems to have been a sort of breast-plate, or thin piece of copper, gen-



erally square, with holes pierced for fastening, and what is most singular, it was seldom, in Illinois, a smooth, plate, like some of these from Ohio, but was corrugated

very much like a piece of zinc from a modern washboard. We have found a few smooth ones, but the corrugated ones seem to have been fashionable.

We have found these thin plates, in a few instances, five to seven inches square.

Then there were both wristlets and ankle rings of copper, and some rings that were possibly for the nose.

Head ornaments were numerous, and we have found several crescent-shaped objects, quite evidently to go over the head as a bright ornament.

Some excellent specimens of these crescent-shaped ornaments for the head, were in our State Exhibit.

These latter ornaments of copper, we may as well state, we have not found in the same mounds with ear-rings or the copper spoons. These may be of later date.

In a mound of more advanced type, in the American Bottom, in Madison county, we have found some remarkable copper ornaments in the shape of turtles.

The objects were between two and three inches across. Both the carapace and plastron of the turtle were represented in a very faithful way, showing all the sutures as they occur. The sutures were made by pressing up a ridge from underneath, the plastron was fastened to the carapace a good deal after the manner that tanners do the same thing now, the edges of the pieces were put together and turned over. Whether the head and legs of the animal had been attached we had no means of telling.

There were a number of these copper turtles in connection with other copper objects as needles, copper axes and some remarkable objects of chipped and ground flint. There was a flint or rather a sort of white, translucent chert celt that was a gem in its way, being first chipped out and then ground off. The whole deposit on this altar, for it seems not to have been with a human body

unless it was burned, was a most remarkable one. There were hundreds of sea shells, some of them very large specimens of *Pyrula* and *Cassus*. Some of the shells were entire and others had been cut out so as to form a sort of vessel.

Some of the copper objects had been made first of wood and then covered with a thin sheet of copper, made to fit even the slightest depression or crevice. The copper had preserved the wood. The salts of copper are a great preservative and we have found many interesting specimens of their fabrics, some of which had a warp and woof like some of our more modern woven goods in a rude way. We have found this fabric of different grades of vegetable fibers and of hair and fur, but not of wool.

A not uncommon copper ornament was a long bead or thin cylinder of metal, made by bending a thin sheet of copper over a round rod until the edges met. These long cylinders were worn on a plaited string of hide or twisted string of some vegetable fiber. We have several times found these cords or strings preserved in the copper tube.



Copper beads made by bending over a short piece of copper until the edges met were not uncommon and sometimes a mound builder beau or belle wore a mass of these arranged over his person in strings. Although we find only the beads, it would be unfair to suppose they wore nothing else.

In my vicinity public improvements make constant inroad into the old structures of the mound builders. One large mound lay where an extra switch of the Chicago and Alton Railroad was wanted. The president of the road owns the land and frequently spends

some of his leisure time there. While they were demolishing the mound where they wanted the switch he was present with a party of lady and gentlemen friends. They were much interested in what might be found, and when a skeleton was laid bare and we had found there was nothing with it but a very fine and peculiar pipe, the president of the road startled me with a little extempore speech which drew the attention of everybody near:

"Professor, do you suppose this old mound builder went around with no dress upon him but this pipe?"

His wife got his eye presently in the silence and I think it spoiled all his ethnological investigations for the future.

The copper objects of the mound builder are of exceedingly great interest to the ethnologist. The Mississippi valley had no Bronze Age like that of Europe. Our advanced race of mound builders, although the most elaborate workers of copper, did it by hammering, although in some instances there would seem to be evidence that dies or instruments for stamping had been used. How they could beat out the copper in such thin sheets as they sometimes used without the metal becoming so hardened as to make it difficult is unexplained. We have seen no evidence that the cutting edges of their axes were hardened, however. One can without difficulty make an impression on the edges of their cutting implements with a steel knife blade.

We have thought that the patina or coating of oxidation with which the copper objects are covered might be made the subject of some data as to their age.

At the World's Fair in Chicago, we had good opportunity to study this matter. Some of our mound copper has a coating of patina equal if not greater than copper

objects from Pompeii and Herculaneum, and similar to other Roman coppers of that and perhaps some older dates, but some of the copper objects of Assyria, especially from about the ruins of ancient date, showed a thicker patina. Without going into a discussion of this interesting subject, we would say that the evidence in this way, and we think it most decidedly worthy of consideration, would seem to date some of our copper-working mound builders back between two and three thousand years, to say the least.

In the exhibit of the University of Pennsylvania, in the gallery of the Manufactures Building, was a most interesting series of objects brought home from ancient Assyria and that region, by an expedition sent there by the University. The party did considerable excavating about some of the more ancient ruins, and obtained quite a number of pieces of pottery, clay tablets and stones, all of which had inscriptions on them in cuneiform writing. These can now be read, in fact the interpretation of these inscriptions in English was placed beside the inscriptions. The date ascribed to some of these objects was in a number of instances as old as thirty-eight hundred (3,800) years before Christ. Among these relics were some objects of copper that looked so much like copper objects we have taken from mounds in Illinois, that we were surprised.

We have in our own collection some of these ancient copper objects from the region of ancient Nineveh, that are quite possibly between five and six thousand years old.

We are inclined to believe we have copper objects from the mounds of Illinois that are quite if not more than half of this age.

### Implements of Bone.

Besides implements of stone and copper, the aborigines had many objects, principally tools, made of bone. These were commonly in the shape of a sort of needle, awls and other pointed implements. We have found very few bone objects that would seem to have been weapons.



The bone cavern at Grafton, with mound on top of bluff, and an old pictographic circle over the cave entrance.

The bones of birds were very often used and those of small animals.

We have found in cave dwellings and cave shelters more of these remains than in mounds. In some of the

dry open cavernous places, both along the Mississippi and the Illinois rivers, bone implements and the remains of animals are very numerous, especially in the dry ashes and accumulated earth, which many of the caves contain.



Bone Fish Hook.

The bones of deer, as well as those of elk, with portions of the horns of those animals, are common, but we have, strange as it may seem, found no bones of the buffalo. This is all the more remarkable since the larger and more solid bones, as well as the horns of these animals, would, apparently have been fine material for implements of various kinds. We think it remains to be explained why, in all our researches in our ancient mounds, we have met with no remains or other evidence to show the presence of the buffalo.



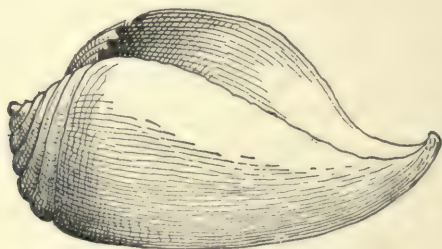
A Sun-Worshiper's Mound.

The teeth of many animals were used as ornaments. They generally were perforated, to be worn on a cord or a string as a necklace. The claws of bear, as well as the talons of rapacious birds, were used in the same way. The bones, and even the scales of some fish, were often utilized in the manufacture of implements or ornaments.

### Shells from the Sea.

Sea shells, from their natural beauty, have at all times been very attractive to primitive nations.

Indications are not wanting that most of the primitive people of North America looked upon the shells from the sea with superstitious reverence. Excepting the native pearls, the sea shells were the prettiest ornaments the old mound builders wore. Although there were beautiful shells in our rivers and streams, these were seldom used in the manufacture of ornaments. Immense numbers of beads were made with great labor and much skill, but they were made almost without exception from

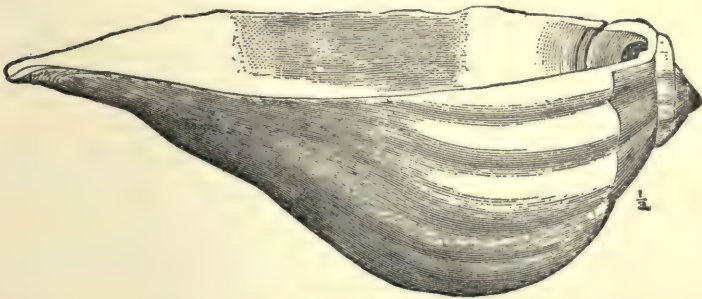


Mound Shell.

heavy sea shells. The form given these beads was various. The most common shape was that of a neat disk or button with a perforation through the center for placing them on a string. We have found some beautiful ones in the Cahokia mounds made pear-shaped, others were round, still others were in the form of cylinders, an inch or more in length. Something of this form was the wampum of which the belts of ceremony were made by the eastern Indians and of which it is said, some are still preserved by the Six Nations. We have found some pretty strings of beads which were made of curved pieces of shell and fixed to go upon a string by having the perforation enter at one end and come out at the side

In many instances whole shells were used by having a perforation so they could be strung. The *Marginella* was often used in this way and must have made a neat ornament. But the prettiest shells thus forming a necklace were the *Natica*, and immense numbers of these must have been brought from the coast, for we have seen hundreds in one string from mounds along the Illinois river. Sometimes small specimens of *Strombus* and *Oliva* were pierced and formed bracelets for the body or neck. Once we found a very pretty necklace of quite young *Pyrulas* and these instead of being pierced, had a crease about the extension of the lip so they could be suspended. Some beautiful specimens of this kind were shown in the State Collection, in fact our display of mound beads was unrivaled. One extremely pretty string of beads was made of fresh water pearls. This was taken from a mound in Calhoun county.

In the State Display were some splendid specimens of very large sea shells from the mounds.

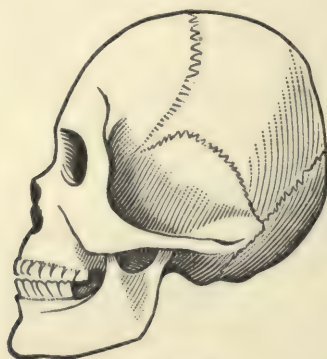


Shell Vessel.

The large shells were generally *Pyrula* or *Cassus*. A *Pyrula* with reversed whorls seems to have been the favorite form. One of these from a mound in Madison county is sixteen inches in length. The largest *Cassus* we have ever seen we found in a mound in Jersey county, near the mouth of the Illinois river. The mound

was a conical one in shape and about twelve feet in height. It was situated on a not very high bluff, the upper part of which was of clay. We made a very large excavation in the center of this mound and at the base of it found a huge sea shell of the *Cassus*. It was nearly eleven inches in diameter. The shell was filled with ashes in which still were some remains of human bones. The inside whorls had been removed from the shell and it formed a very neat and pretty vessel. The curl of the lip at the extremity made a sort of hook so it could be hung on the limb of a tree. The shell containing the ashes was the only relic of any kind the mound seemed to contain.

In another mound in Calhoun county, we found a huge *Cassus* with the columella and whorls removed and so large as to contain a human skull, which sat within it, and of which the following cut is a true representation.

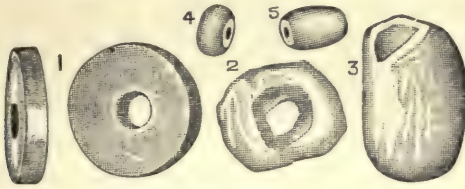


Mound Skull.

Most of these large sea shells seem to have been used in sacred observances and were often placed in the mound with ashes of the dead or with the body.

Many ornaments and objects were perhaps insignia of rank or of religious significance. A not uncommon form of these was a sort of gorget in the shape of a disk to

be suspended from the neck or fastened on the breast. These gorgets are sometimes elaborately engraved with characters or figures of exceeding interest since the history of these people is so utterly unknown to us. Frequently they bear the figure of a most ancient cross, strangely similar to forms figured by ancient people of other and foreign lands.



Shell Beads.

In the State Exhibit were several very fine specimens of these engraved gorgets from Illinois mounds.

One had elaborately engraved upon it the figure of a spider with a cross upon its back. We have seen several of these. One very fine specimen had the figure of a cross engraved without the figure of the spider being engraved upon it.



Gorgets from Mounds.

Still another fine specimen had the figure of a person holding a bird similar to a turkey by the neck, with his left hand, while in his upraised right hand was a hafted stone axe very well shown.

The figure of the person was on one knee and from his waist hung a very peculiarly ornamented apron. It may be as well to remark here that in the State Display was a beautiful gorget made of a piece of slate covered on one side with copper and on the copper in relief was a six pointed star.



Shell Gorget from Mound in Illinois.

Where the aborigines got so many of these sea shells, as well as mica, obsidian and copper, can only be accounted for by either supposing they traveled to distant parts of the country or had some sort of traffic or commercial relations with people who lived about Lake Superior and the Rocky Mountains or Mexico, and the region about the sea coast.

We think we have not studied these questions with sufficient thoroughness to answer them yet.

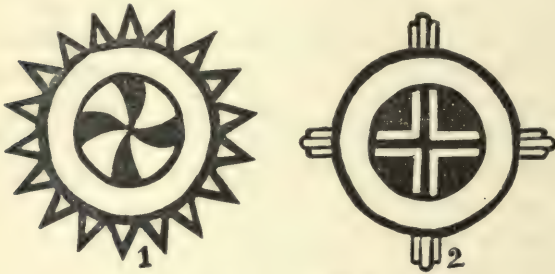
Farther exploration in some of our larger mounds is needed, for more history and evidence. We would rather see some great find like Morehead's, made in the Hope-well mound, than read the theories of a dozen persons, especially if those persons have not made researches and studied the question in the field, and in the mounds themselves.

### Pottery and the Manufactures from Clay.

Illinois, being situated in a sort of geographical center, especially about the mouths of the Missouri and Illinois rivers, was, in the long ages past, often invaded or visited by tribes and peoples from every direction, for there were many tribes over such a wide extent of country. In this region there are hundreds of mounds made by different tribes of mound builders, who had different customs, and agreed only in the custom of mound making, making them in different ways, for different purposes, and placing different objects in them. Many of the tribes, however, who have lived here or sojourned for a time, were not mound builders at all. But still there are evidences of their occupation, and many objects which they they have left. This fact proves to be a great difficulty in the study of our antiquities, and gives generally to the beginner or casual observer many erroneous ideas.

Over the State of Illinois are the remains of pottery which some people have left there. And we know, from Catlin's observations among the modern Indians, that there were some tribes whom he saw—such as the Assinaboins—that did not make or use pottery at all. Most of the whole or nearly entire pieces we obtain, are generally from mounds or graves, and, quite possibly, not many tribes had the custom of putting pottery in mounds or graves; so that our study of the work of our primitive people in clay is very narrow, and almost wholly confined to a few tribes, who placed it in the graves or in mounds with the dead. Our great mound builders—like those of Cahokia and the mounds on the Illinois, where we find the beautiful pipes and elaborate copper objects—seldom, if ever, put any of their specimens of pottery in their mounds; and we only judge that many of these people had pottery by seeing the

sherds about where they lived. There are thousands and thousands of peculiar sherds in this region that we recognize at once by peculiar marks on the outer face, and of these which we have seen, never yet a whole vessel. All this must be borne in mind when we treat of our ancient pottery.



Figures on the Exterior of a Burial Vase.

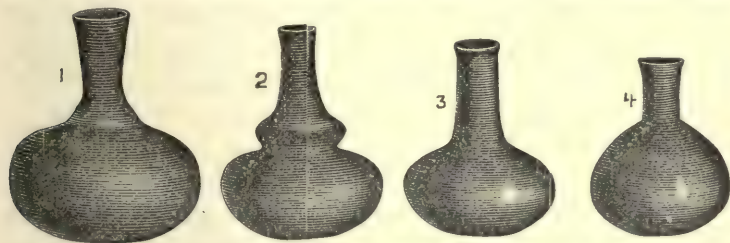
In the Illinois Exhibit at the World's Fair, there were a hundred pieces of this ancient pottery nearly all entire. Many people will no doubt be surprised when I tell them that very few pieces of this fine collection of pot-



Figures on the exterior of a Burial Vase along the Mississippi.

tery came from mounds, but from ancient burial places and graves. About the southern part of the State and in the American Bottom, and also a little way up the Illinois river, there lived a tribe of aborigines that were

great pottery makers. They selected some peculiar clay, and after mixing it with pounded shells and other ingredients, so kneaded the matter into a tough, plastic mass that after a vessel was made of it, it required but little burning or baking to make it fairly serviceable. But we are indebted, for our possession of these things to-day, to a peculiar custom this tribe or people had (for there were several tribes of them), of placing in the graves of their dead articles of pottery containing water, and perhaps other liquids, together with food, quite evidently in accordance with some religious belief that the spirits of the departed needed nourishment in this or another world. Primitive people in Europe, including our own forefathers, and, in fact, all over the world, have had a custom something like this. In southeast Mis-



Burial Vases.

souri, Arkansas, and in some of the other southern states, some tribes with this peculiar burial custom made mounds, and often put pottery in them; but there were other tribes in Tennessee, Arkansas, Missouri and southern Illinois, that buried their dead with the pottery vessels in shallow graves, and often made large cemeteries, with the graves quite close together. There are a few of the pottery mounds in southern Illinois, but their cemeteries are common, especially about the rich bottom lands of the Mississippi. These pottery-burying tribes perhaps never had extensive settlements far above the mouth of the Illinois river.

When a member of these pottery-making people died there were prepared the vases and vessels to put in his grave. Sometimes several, often only one or two, probably depending upon the prominence of the deceased, or the grief of the family. Some of the most beautiful vases we have found, had been buried with children, probably prepared by some fond mother's hand.



Burial Vases.

The vessels intended for water, quite evidently had in many instances long, narrow necks, generally contracted above a wide, round base, while those for food, which are most numerous, are in many instances more shallow dishes. There are, however, a very great variety of forms, in fact excepting the long neck water bottles in which form there is more of a general sameness, there are hardly any two just alike.

Some made to represent animals and birds are not uncommon, and we have found fishes and reptiles with the carapaces of turtles and valves of shells. Quite a common way of representing fowls and birds was to form a dish or bowl and place the head, fastened at the neck, on the edge of the bowl. There is always on the opposite side of the bowl a projection supposedly representing the tail of the fowl.



We have seen a number of these burial vases with human heads as an ornament on the rim, and sometimes the entire human form is attempted, but these generally present an appearance more grotesque than otherwise.



Burial Vases.

These singular vessels are generally neatly made, and some are even elegant in design and finish. Some of the better made ones are covered on the outside with red or colored clay, which has been rubbed very smooth and polished. We have never seen a glazed one, nor have we found among the burial vases one that seemed to have been designed and used for a cooking vessel. The majority of them were doubtless made on purpose to put in the grave.

We were working at our investigation, one beautiful day in the early spring, in a field at the base of the great Cahokia mound, when our probe struck something which proved to be one of these burial vases. Further investigation revealed the fact that we had found one of the pottery-makers' old cemeteries; at least from the presence of a few human remains we judged that it had once been a burial place, but with the exception of one very peculiarly shaped human skull, the bones had almost completely decayed long before.

The next day, beneath the grateful shade of the great temple mound which towered a hundred feet above us, we took from that ancient tomb, which was not two rods square, over one hundred perfect vessels. It was a magnificent collection representing men, birds, beasts

and fishes. On a small scale it was a most interesting and artistic reproduction in clay of the animated nature of the region. Some of these vessels were in the State Exhibit at the World's Fair. A pottery-making and pottery-burying tribe of people had placed these singular objects in the earth there, but what connection they had with the great mounds that towered all about us, we could not tell.



Burial Vases.

Near by on the ground I had noticed the remains of a broken hoe of steel, and near this were the remains of a basket and a plow handle. I knew these things had no connection whatever with the mounds nor the pottery. These had been tools that belonged to the man who owned the farm and raised potatoes for the market. On the top of one of the large mounds in the same field, we one day picked up a little crucifix of pewter. The little ring just above the Savior's head, by which it was suspended, was broken. One glance at the object and its presence there was accounted for. It had probably been

made in France, and a long time ago it had probably been brought here by some Jesuit priest, and the pious Frenchman or modern Indian, to whom it had been given or sold, had lost it here on the mound. But it had no connection with the mound's history in any way. There was nothing at all hard about any problem presented here by the presence of the crucifix in the field.

But with the pretty burial vases we have just been exhuming it is very different.

All over the fields about the great mounds on the Cahokia, and on the sides of the structures themselves, are found, almost without numbers, pieces of pottery. And we are interested to note that a majority of these sherds are not of the same kind we have just dug up in the field. They were not like our burial vases. Could



Burial Vase from Cahokia.

they be pieces of cooking vessels, or is it remains of pottery of another people? Another interesting fact we noted in this connection was, that in making an excavation in one fine mound of the Cahokia group and in the same field in which is the Great Mound, we found potsherds like those in the field from the very top to the

bottom of the structure, showing that when the mound was being made, in gathering up the material from the surface pieces of pottery were there then.

That there are fragments of pottery in the earth composing a mound does not conclusively prove that the people who made the mound also made the pottery. Yet many very harmful and seriously erroneous theories in archaeological matters have been formed on no greater evidence. Iron has been found, glass has been found and a crucifix, and the Indians learned to make pottery from the French. Things like this have been written about and spoken of by people occupying positions in which they ought to be better posted.

It puts us in mind of a conversation between two colored men:

"What time is it?" asks Snow meeting Sambo.

"How do you know I got a watch?" questions Sam.

"I see de chain hanging down," retorts Snow.

"Look a heah, niggah, if I had a halter round my neck would you think I had a horse inside of me?" says Sambo.

We have found some very fine pieces of pottery on the Illinois river, near its mouth, but it grows very rare as you ascend the stream.

The pottery used by the primitive people of Illinois for domestic and culinary purposes we know but little of, although oftentimes good sized pieces are found about the sites of ancient towns and the kitchen middens where some ancient family has lived. It is very rare to see one of these entire. From the fragments it would seem that frequently vessels of good size were made by covering the inside of woven baskets, the whole being placed in a hot fire until the basket was burned and the pottery well hardened. From the many ancient village sites in sheltered places in the vicinity of good springs of water

and the great quantity of pieces of earthen vessels covered up by the debris accumulated for ages, it is quite evident that many of our primitive tribes and peoples used at times earthen vessels for cooking food. Some quite possibly were set on stones in some way, but almost all these old vessels of every kind had round, instead of flat bottoms like our modern vessels. We have found remains of culinary vessels, too, that showed how they were, evidently, fixed for suspension by having projections either on the outside or inside of the rim. Sometimes, too, there were ears or holes in the edge of the rim.



Burial Vase from Cahokia.

Quite possibly many of our primitive people made or used salt. About the salt springs in the southern part of Illinois, and at the salines near St. Genevieve, Missouri, the remains of the earthen vessels, used in salt making are exceedingly numerous. While exploring the region about the salt springs of St. Genevieve county, Mo., we found two of the earthen salt pans so common in fragments, about the Illinois salines. The two large pans had been used presumably by some aboriginal mother as a coffin for her dead child. The body of the child had been placed

in one and the other turned over it. The whole had then been buried on the top of a hill. These well made vessels were in the shape of shallow pans, some three feet across and not more than seven or eight inches in depth. They were on the bottom about an inch and a half in thickness and made of clay and pounded shells. These are the only entire specimens of the vessels for salt making we have seen. About these ancient salt works are excellent opportunities to see how the larger pieces of pottery were manufactured in various ways.



Ancient Pottery from Illinois.

The most recent specimens of aboriginal pottery we have observed are found in what are termed stone graves. Some not very ancient tribes seemed to have had a custom of burying their dead in shallow graves, on the bluffs as well as in the lowlands. These graves were made by setting upright thin flat stones forming a box like enclosure in which the body was laid and covered over with one or several large flat stones. The whole covered with a thin layer of earth. At the head of each one of these graves was usually placed a piece of pottery, more or less rude in character. Some of these we have found have never been burned, but were, apparently, simply sun-dried. These stone graves have been frequently found along the Illinois River, but were more numerous below the mouth of the Missouri and in the southern part of the State. They were evidently the fag-end of the pottery-making and pottery-burying tribes.

In all the cemeteries and burial places of pottery tribes but little is found of them except their work in clay. Occasionally there is a pipe, mostly the same material as the burial vases. We know little of their stone implements, except that they did not approach the finished work in this line of the mound builders. It is doubtful if they had any copper, or any commercial relations of much extent, and they were never powerful tribes or very numerous, except it may have been in the southern States.

As before remarked, the Stone Age of Illinois shows a great multiplicity of forms in the relics found in the soil, more so, perhaps, than any other region, mainly on account of its geographical position, for there comes into the State such a multitude of rivers and water ways from every direction, and these water ways were mostly



Ancient Pottery from Illinois.

the paths the ancient people followed. In the south we have the Ohio, with its southern branches of the Tennessee and the Cumberland, and then up the great Mississippi, the Missouri and the Illinois, together with many smaller streams. Tribes have been either driven from their homes from every direction into Illinois, and quite possibly lived here for a time, or until driven away again or become extinct. That we have the remains of one extinct tribe we know from modern history, for our own Illini or Illinois tribe was annihilated by the Iroquois or Six Nations from New York regions. This was witnessed by white men.

But what became of the most advanced of all our primitive inhabitants, the mound builders, that great nation which built the great pyramids on the Cahokia and the people who made the enormous earth works of Ohio?



Burial Vases from Mounds in Illinois.

The mounds on the Cahokia creek are the work of a great nation, for here in the midst of a level plain rises a pyramid over a hundred feet in height and covering sixteen acres of ground. And this mighty pyramid—for it is pyramidal in shape—is surrounded by nearly a hundred others of great size, and made only with a prodigious amount of labor.

These are the greatest ruins on the continent.

Is it not very singular that a nation of such vast numbers and organizations, both civil and religious, with the sustenance necessary for the accomplishment of such an undertaking, should disappear without a trace of history, without even a legend or story concerning them among the red Indians we know so well, and who seem, probably, to be their successors?

A great plague or epidemic, that swept every soul of them into the grave, might account for some such total annihilation. But we only surmise this, and do not know actually, and perhaps never will, unless we find some sort of evidence in their graves.

### **Flint Implements.**

There is one other class of relics of the Stone Age in Illinois of which our State had one of the finest and best exhibits at the World's Fair in Chicago. This was the flint objects. We have purposely left our description and history of these for the last, for they represent the Stone Age not only from its beginning until the end, but they embrace such a variety of forms, made and used by such different peoples, that there is presented something from all grades and classes of the various tribes and nations that have lived in this region from the beginning of the Stone Age to the end.

The chipping or making of a flint point of the more primitive and ruder kinds was a simple affair, and the merest beginner could chip off something that might answer for a rough point. This was the beginning, but that the manufacture of the finer flints became in a manner, in the later periods, what we might term an art, no one can well dispute who looked at the Illinois Collection of hundreds of the most beautiful objects of this kind ever exhibited.

The grades of flints vary from very low to very high and perhaps there is no place in the United States where there a collection of these relics could be made in such variety and beauty as in Illinois.



An Ancient Pictograph Carved on Rock of the Illinois River Bluff in Pike County.

In the Illinois Collection there were probably twenty thousand from which those exhibited were selected. Among such a number of varieties and forms it could be expected that only some of the more decided of the various types could be described.

Collectors are generally quite ready to class chipped stone objects of certain forms found so plentifully in Illinois, as arrow and spear heads. If the object is notched or fixed for hafting it has been an arrow point; if it seems to be a little too large for an arrow point it is called a spear point. The fact is that quite probably the great majority of these objects were neither arrow nor spear heads.

In our explorations among the mounds for some thirty years we have seen the remains of very many of the aborigines who had been killed or wounded by arrows. These arrow heads are frequently found still sticking in the bones. In almost every instance these points are very small. We once found a skeleton that had six

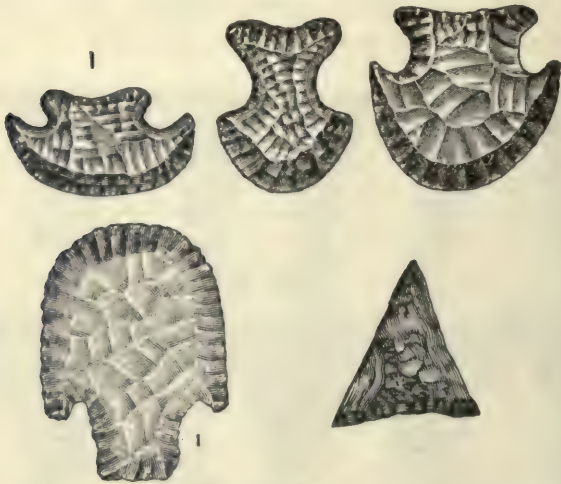


arrow points still in the frame. They were in the State Exhibit. Not one of these was more than an inch in length. In the Smithsonian collection at Washington are a large number of arrows obtained from various Indian tribes and pointed with stone; none of these

points are over an inch and a half in length. In fact it seems to be well enough shown that the aboriginal arrow point was comparatively small.

In one skeleton from a mound on the Illinois river, one of the vertebra of the back-bone had been pierced by an arrow head which still remained in the bone. It was a small, sharp flint not quite an inch and a half long. It was without notch or tang.

It is quite probable that many of the larger objects we call arrow heads were tools of some kind and notched or otherwise shaped to be fastened to a handle.



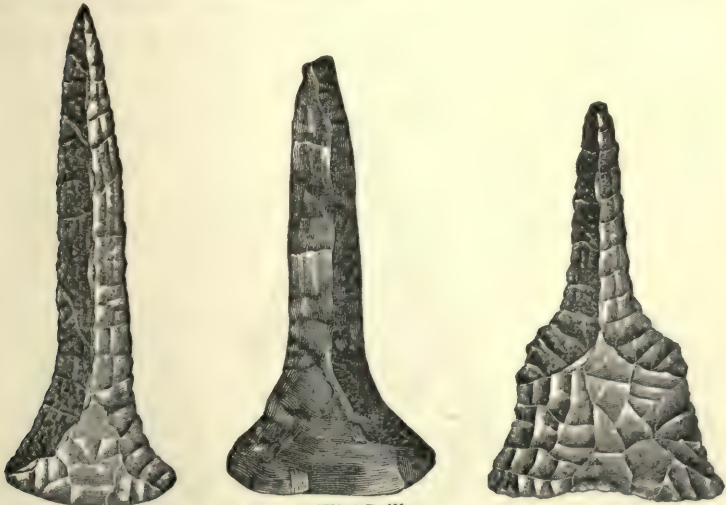
Flint Tools.

Some of the Indian tribes still use these tools. We have seen hundreds of these among the Utes, Cheyennes and Arapahoes. At the time of the discovery of gold at Pike's Peak we saw many of our Indian tribes in that region. Firearms had not yet been introduced among these Indians, and many of their weapons as well as most of their tools were of the primitive order. Their

knives were mostly made of flint and very much resembled the larger so called arrow heads so common in Illinois.

These flints were fastened to a short handle, either with a thong or sinews, or by being fitted and fastened with pitch or gum or even glue. We have ourselves seen Indians cut leather easily enough with these hafted flint knives.

There are some forms of these tools that are followed quite persistently and some of them are made with great skill. It is easy to imagine that among the aborigines, as with other people, there were some persons who had a genius for making objects and working the flint much more skillfully than was common.



Flint Drills.

Quite a common form, of which we had some very fine examples in the State Exhibit, are called drills, and their form does suggest some such sort of use. They are generally long slender points with a heavier base for fastening to some handle for the tool. Some of these pretty

flint drills are marvels of skillful work in chipping, and are found especially about the water courses. We have collected them in JoDaviess and Carroll counties in the extreme north, as well as in Alexander county, in the southern end of the State. In Calhoun and Jersey counties they are more plentiful, however. One of the most beautiful ones we have seen came from Union county; it was nearly six inches long. Some of the most delicate ones we have observed we took from a mound in St. Charles county, Missouri. They were very small and marvels of minute delicate chipping and pointed at both ends.

It is quite probable that in the manufacture of these more delicate tools much depended on the artist's selection of his material, and not only this, but it must be in condition; that is, must not be too dry or weather toughened.



Beveled Edge Flint.

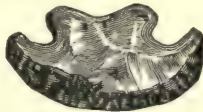
Much might be written about the material of which the arrow points and tools were made. We call it flint, which name has obtained and possibly will have to be kept, but it is really not flint. We have no flint in this country like the flint of Europe, and of which our old gun flints were made. Flint is a silicious formation in chalk beds,

which we do not have. Our arrow points and flint objects are made of nothing more than a kind of cherty limestone. Some of this chert, which is the proper name, is more or less silicious and of different colors, but still it is limestone, and most of our flint points will burn into lime, unlike the flint of Europe. Chert, which is our flint, abounds wherever the sub-carboniferous rocks are found.

The aborigines, without doubt, however, had certain localities where they obtained a certain quality that suited their purposes.

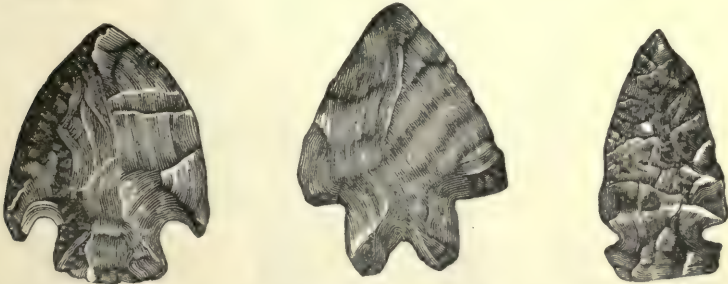
Sometimes in the mounds we have found masses of this material evidently stored away for future use.

Some small tools, sometimes called bunts or scrapers, are common.



Scraper.

Some of these, after being hafted, might have been used in scraping skins, or in smoothing the surface of other objects.



Some cutting implements were, quite probably, simple flakes fresh from off some special chert core. These sharp-edged flakes were quite common. We have found many of them in the mounds.

Among the common implements are some very pretty

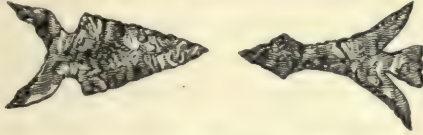


leaf-shaped tools that were used for certain purposes; perhaps some of these were used for cutting or scraping something not so very hard. We collected some of these leaf-shaped objects for the State Exhibit that were simply exquisite in shape and general finish. Some of them are three or four inches in length.



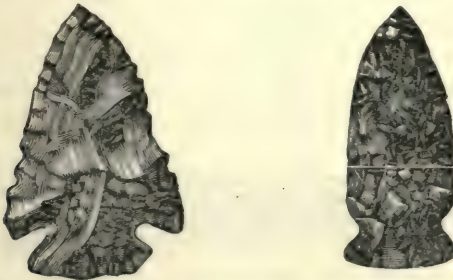
Spear Head.

Spear heads, like the arrow points, present a great variety of forms and are only distinguished from them by their much greater size.



Great skill is often shown in the making of these spear heads, and like those of the drill, the material was evidently selected with care. The principal qualities were doubtless that of toughness combined with qualities for successful chipping. Although somewhat brittle they are not so easily broken as one would suppose. We have picked them up, sometimes five or six inches in length, on the surface of plowed fields where they must at times have met with rough usage in the cultivation of the land, they were still entire to the extreme fine point.

A spear was always a formidable weapon and was doubtless a favorite one with our aborigines.



Especially was it a favorite arm with the Indians on horse back before they had fire arms and we have seen them slay many a buffalo with spears pointed with a rude but sharp piece of iron or steel obtained from the whites. Flint spear heads are most numerous about the rivers and streams of Illinois where they were doubtless

used in fishing. While it is somewhat rare to find flint implements in a mound we have on a few occasions found some rare and beautiful objects of this kind.

In a mound in Calhoun county we found one very fine point, possibly a spear head, that was some ten inches in length. While spear heads and objects of this kind were made of our common white or colored chert there is occasionally one of harder material. In the State Exhibit were two or three very fine objects of this kind made of chalcedony or quartzite. I obtained them in Carroll county in the northern part of the State. There was also another very fine spear head of translucent quartzite from Union county in the southern part of the State.

Spears and ceremonial objects of obsidian like those found by Morehead in the Hopewell mound in Ohio, are also very rare in Illinois, and are only found in mounds. Among the surface finds we have seen but two or three small specimens. Spears of copper were seldom used by the primitive people of Illinois and are very rare. There were two fine ones, however, in the State Exhibit, both found in Illinois.

We have seen a few flint implements shaped somewhat like a dagger and possibly intended, as is thought by some, to be used as a weapon by being held in the hand.

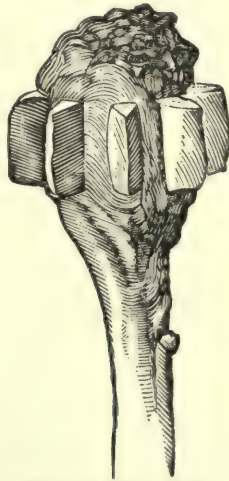


Flint Tool.

One very fine specimen somewhat of this form in the State Exhibit, I obtained from Calhoun county; it is six or seven inches long. We also have one from Jersey county. I doubt if they were weapons or flint daggers. All of this form we have seen are small and I shall be inclined to place them in the list of tools.

There is another very interesting form of flint objects generally classed as arrow points; some of these are notched in a peculiar manner and all of them seem to be worn smooth about the neck of the notch as if they might have had a string about them and the string had worn the notch smooth by suspension or otherwise. There were quite a number of these in the State Exhibit.

There is still another form, called by some, knives, which we can hardly accept, however. Some of these flint objects are made with great skill in the chipping. They are pointed at both ends and sometimes, although not in every instance, the edges are beveled.



Flints in a War Club.

Many of the tools have their edges thus beveled off in a very skillful manner. It is the general impression among collectors that these objects are arrow points made with the beveled edges so that they would twist or whirl in passing through the air.

They were probably tools of some kind. We have seen among the Ute Indians tools somewhat similar with short handles.

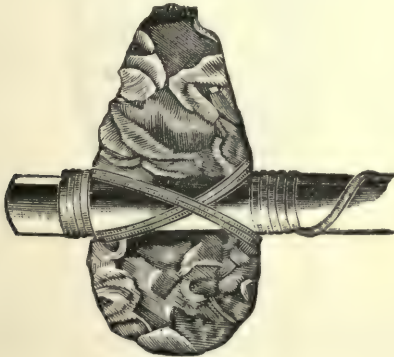
There are a great many other forms of flint implements found in Illinois, the description of which, if accompanied with illustrations, would be of much interest.

There is one class of flint implements in which Illinois is particularly rich and in which there are some forms that might be said to be peculiar to the State. These are agricultural implements. Whether Illinois had indigenous men, we only think possible, but have not the evidence to make it conclusive. Paleolithic objects may be numerous in our present age, but in the age beyond, the glacial, there seems to be no sign of man whatever. But it seems to be established that in our State there were very early inhabitants and as the evidence from our caverns and cave shelters seem to show they were the veriest savages, possibly cannibals. After or among these somewhat vague people comes somehow an improved state of affairs with the inhabitants. Somebody brings or finds a very primitive kind of religion and ceremonials are instituted, mounds are built. Finally these mound builders became a great nation with an established religion and an organized government. They lived in large communities on the rich bottom lands, and their numbers and manner of life made it necessary that sustenance should be provided in other ways than that of savages or in the manner of our Indians. They became tillers of the soil and had cornfields and were not dependent on the chase or hunting. These people became so numerous and strong and so well organized that they were able to erect enormous temples or places on which to have their ceremonies or religious observances. That there were other nations or tribes of people in the land is quite evident from the fact that in some places these mound builders had defensive works, as is shown in Ohio. In Illinois, where their largest temple and town was situated, this did not seem neces-

sary. The "Great American Bottom," as it is called, an extraordinarily fertile tract of low land on the Mississippi, seventy-five miles long and five to ten miles wide, was their central dwelling place, with colonies about them for a hundred miles or more; some of the fine bottoms on the Illinois were occupied by their colonies, and here are found their great religious mounds, and the rich bottoms on the Illinois, like the American Bottom are probably to this day destitute of forests where these people cultivated corn, vegetables and other edibles.

From some of these mounds have been taken the most advanced work of the stone age we have seen, and the only chipped and ground implements we have met with.

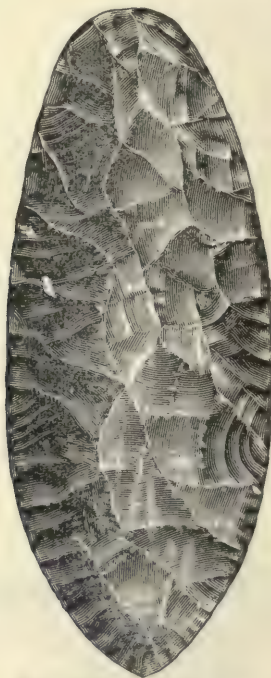
Their agricultural tools were of stone and made with a degree of skill that is unrivaled in the chipping of flint tools. Some of the flint hoes when fastened on to a handle in a firm manner were in fact no mean implement with which to dig about the corn and growing crops.



A Hafted Spade.

The large flat, slightly ovoid, instruments, always wider at one end and known as spades, were tools with which to dig the soil. Some of these have seen so much use,

probably in a sandy soil, as to have a very nicely polished surface about the larger end, the smaller end having doubtless been fastened to a handle. One splendid specimen in the State Collection was seventeen inches in length. We obtained it in Randolph county; another fine specimen from Madison county was sixteen inches long; several others from Madison and St. Clair were but little smaller.



Flint Spade 17 Inches Long.

One fine specimen from Union county was polished over its entire surface, showing that both ends had been used in digging.

There were two varieties of the large spades that seems to have been followed persistently. From certain evidence it would seem to be quite probable that certain

persons or families were more skillful and followed the business of making especial forms of stone implements.

Across the Mississippi river from Chester, Illinois, there are a number of mounds in Perry county, Missouri. A farmer here plowing over one of these mounds in his field, felt his plow strike something, and upon looking to see what it was, found buried there sixty-three flint spades. None were less than a foot in length, all precisely of the same form, and not one of them showed any signs of being used. They were possibly new when buried there. We were able to secure most of this find, every one of which was perfect and a gem of its kind. We think one person had made all these objects. In the northern part of the American bottom, in the vicinity of Alton, the common form of the large spade found has a broader edge and straighter sides, showing the handiwork of another family of artists which followed a peculiar outline in their chipping.

Agricultural implements of a smaller kind are very common in the Illinois river valley, but not exactly of the form of the larger one. Occasionally a specimen of our more southern and larger forms is found as far up the river as Peoria but they are comparatively rare there.



Notched Hoe.

The notched hoes or spades with notches for fastening to a handle are very much desired by collectors.

They are not so common as the spade and probably were much more difficult to make, They are peculiar to this region or at least very rare elsewhere.

Like the spades, there are two distinct forms of the type—one with straight sides and a broader edge, the other more circular in outline. Occasionally these notched hoes are found very much worn, showing that they had doubtless been used for many years, for the attrition of the soil must have affected their flinty surfaces but very slowly. And then one is occasionally found so bunglingly and rudely made, that it is very plain that an attempt had been made to evade an infringement of the other fellow's patent.



A Cahokia Mound 50 feet high.

When we speak of the use of these implements in the cultivation of corn, how do we know they had corn? We have found it in their mounds on more than one occasion, sometimes in a charred condition and otherwise.

In excavating to the bottom of one of the Cahokia mounds, we found, besides the grains of corn and some cobs, bundles of cornstalks bound together with cords or strings. We have some charred specimens of this corn, as well as pieces of the cords and strings, as was shown in the exhibit.

### **Corn Cob from Mound.**

The corn we have found in the mounds was a rather small ear with eight rows. The rows were in pairs and between each pair of rows of grains was an interstice or furrow. The grains must have been of good size, for even the charred grain we have found were of fair size.

At the bottom of an excavation in one of the Cahokia mounds not only were the remains of corn but seed of melons like pumpkins and squashes. Some of these seeds too were of large size. In the bottom of this mound we found a number of strings and cords that seemed to have been made of some kind of vegetable fiber.

We have found, in several instances, some of their fabrics, too, preserved by being in contact with copper. In some of the cloth, both of hair and vegetable fiber, could be seen the warp and woof. All the fabric we have seen, however, was coarse in texture, more like our bags or sacking material.

That these old mound people who once lived on the rich lands of Illinois had made a very material advancement from the state of semi-savage or barbarian life of our modern Indians there can be but little question.

We have but to point to the huge mounds in Madison and St. Clair counties of which our modern Indians know absolutely nothing and which no modern Indian that we have any knowledge of had a capacity to make, or ability to erect through insufficient organization, want of numbers, manner of life and disinclination to

engage in physical labor. We are aware that an effort has been made to show that all our mound builders were simply the ancestors of our present red men. We do not think it has been shown, but space prevents us from going into this discussion.

That our red Indians are indigenous to the country is probably true. But that another race or races lived here and were much farther advanced than the Indians and finally suddenly and totally disappeared we believe also is true.

That this advanced race of mound builders had customs, religious or otherwise, which they learned in some way from other countries we believe also.

We believe that when the mounds of Illinois are fully explored we shall have sufficient proofs and have a history of great interest.

## GLACIAL GEOLOGY.

BY OSSIAN GUTHRIE.

UNTIL a very recent date, the glacial geology of Illinois seems to have been almost entirely overlooked, or, if not overlooked, misunderstood. Recent researches, however, have developed the fact that the prairies of Illinois not only owe their existence to glacial action, but afford one of the richest fields on the globe for the study of glacial phenomena.

Four great glacial streams invaded the area now included within the boundaries of the State of Illinois. Two of these came directly south from the Lake Superior region, bringing native copper and rocks or boulders of every variety found on the northern peninsula of Michigan and in eastern Wisconsin. These streams entered the domain of the State from the north, and scattered their promiscuous cargoes along and west of the Illinois valley. The pathways of these streams, or glacial rivers, are easily identified. One scattered red porphyry in great profusion, but scattered a comparatively small quantity of copper. The other distributed copper in considerable quantities, or more profusely than any other stream, but no red porphyry, and both are distinguishable from the two Lake Huron streams, which invaded the State from the east, by the absence of three distinct varieties of conglomerate which are found together and in profusion along the pathways of these streams.

One of the streams above referred to, left Lake Huron at Saginaw Bay, passed diagonally across the State of Michigan, entered the Kankakee valley near South Bend,

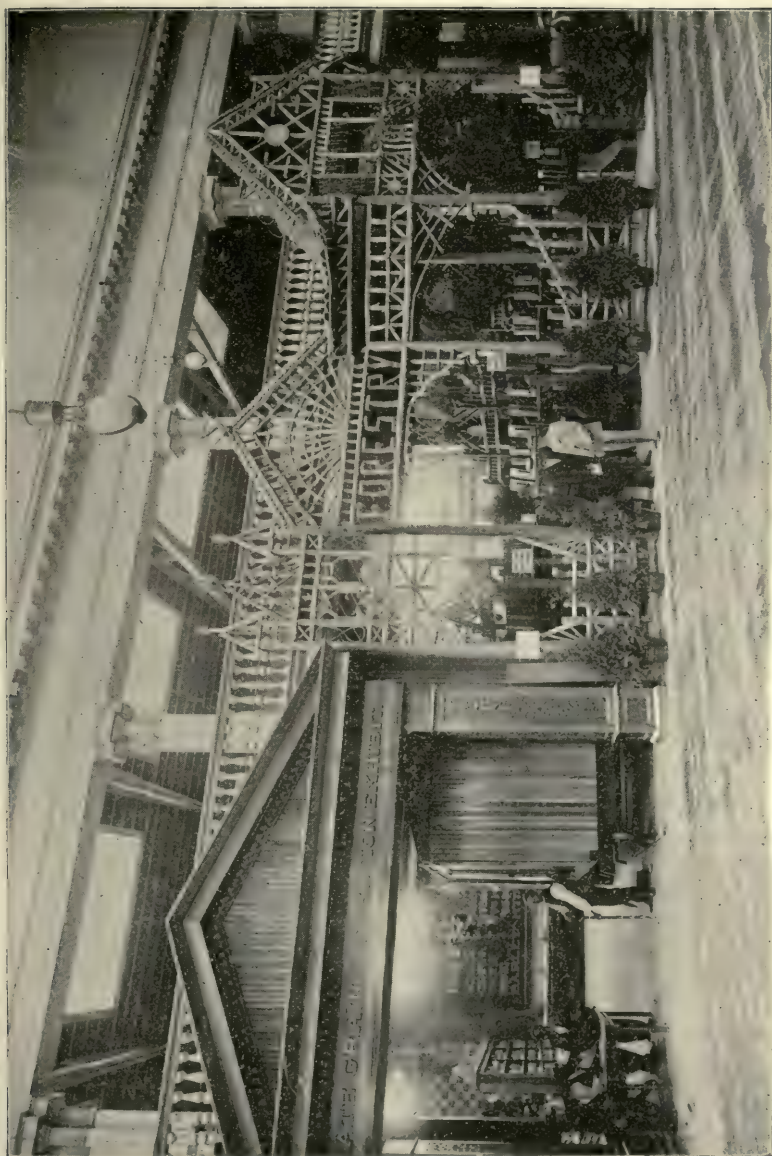
and followed thence along that valley to the Illinois, which valley it followed to the Mississippi river, scattering the red jasper or Huron conglomerate and two other distinct conglomerates, all of Canadian origin, all along its tortuous pathway. The other stream passed south through Lake Huron, out of the west end of Lake Erie, and thence along the Wabash valley. This line seems to have been the one of least resistance, and consequently, the pathway of the larger glacial stream, for, in addition to supplying the Wabash valley proper, it sent out a broad sheet, or series of inferior streams, in a southwesterly direction, to the valley of the Illinois. This statement seems to be amply supported by the fact that the three Canadian conglomerates are scattered in profusion all along this line on the islands in Lake Huron, and thence along the line to Lake Erie, along the Wabash, and thence diagonally across Illinois to the Illinois river valley. All doubt upon this subject, if any there was, seems to be removed by the Guthrie Collection in the Illinois State Building at the World's Fair relating to the glacial geology of the State. This collection contained about 1,000 specimens, almost every one of which was either glacial-marked, or was a fragment from a glacial transported boulder. Every specimen or variety in this collection is to be found in the drift of Illinois. The glacial streams which invaded the area embraced within our State lines, had swept over an estimated area of over 700,000 square miles, and gathered together probably a greater variety of rocks and other material than any other glacial body had ever delivered upon an equal area.

The glacial collection of Mr. Guthrie, and the geological and relief maps of Illinois, especially prepared for the World's Fair, and made from the most reliable data obtainable, seemed to be in perfect accord. These features

of the Illinois Exhibit, which, as before stated, had heretofore either been neglected or misunderstood, were visited by many eminent scientists, whose admiration of the exhibit was universal.

Recent exposure of glacial grooves on the floor of the DesPlaines valley at Lamont, by the Drainage District Trustees of Chicago, and the cutting through of the rock barrier at Momence, have furnished the most conclusive proof of the correctness of the conclusions above expressed.





GRAIN INSPECTION AND FORESTRY EXHIBIT.



## FORESTRY.

BY MARTIN CONRAD, SUPERINTENDENT.

**N**OTWITHSTANDING the fact that Illinois has always been known as the Prairie State, early data prove conclusively that, although unevenly distributed, fully one-fourth of its area was covered with forests when the white men first entered the territory.

There was probably no county entirely without timber, but the real forests were confined to the southern portion of the State, the broad bottom lands of the Mississippi and Illinois, together with nearly one-half of the delta formed by these rivers.

Many counties throughout this section presented an unbroken forest, chiefly of deciduous trees, rich in variety, and of a quality unsurpassed on this continent. The growth on the margins of the smaller streams, areas between forks of creeks, or wherever protected from fire, including the "oak openings" peculiar to the broad rolling prairies, consisted almost entirely of burr, black and red oaks, which had expended their force in growing lateral branches to such an extent that, viewed from a distance the park-like groves, devoid of all undergrowth, recalled the scenes where grew:

"The Baldwins and the Jonathans,  
The Gillyflower and the Wine,"

at the old homestead, where "oak openings" and prairies were alike unknown. There were also "oak openings" of quite opposite development, since the wood consisted of large burly roots, or "grubs", which had been expanding their gnarled deformities for many years,

evidently by sending up shoots every spring, only to be as regularly razed in the autumn, by the annual holocaust that destroyed everything of an arboraceous nature, with the exception of these under-ground "grubs" and mature trees whose heavy barks proved an efficient shield against the recurrent seas of flame. Despite the scientific theory that fire was a prime factor in the formation of our prairies, the groves that dotted the landscape, and the presence of these trunkless living roots in the ground, go far to prove the contrary, since the former had attained mature growth, while the latter evidently sustained saplings of no mean proportions before the fire era.

The settlement of the State, through which the forests yielded to the axe, brought with it by way of compensation the gradual cessation of these fires, and thus gave the "grub patches" that survived the plow of the husbandman, an opportunity to spring up and expand into beautiful groves, while the openings that appeared to Col. George Rogers Clark, "like islands in the sea," are being gradually supplanted by vigorous young forests, until the erstwhile characteristics so peculiar to arborescent growth on our prairies have nearly all disappeared.

Taking this spontaneous extension of the natural growth of the prairies into consideration, together with the fact that many forest trees have been planted where formerly were only grass and weeds, it has been stated with considerable plausibility that the forest area has not been impaired; but this unfortunately is not borne out by the facts, as it is safe to say that there has been no increase since 1880, when it was estimated that there were twenty-three counties in the northern part of the State with seven per cent woodland; twenty-one counties in the district extending from the Illinois river, below Ottawa, to the Mississippi with fifteen per cent; seventeen

counties east of this with six per cent; in the district south of this, comprising seventeen counties, twenty-four per cent; thirteen counties in the Kaskaskia district foot up twenty-one per cent; and the remaining eleven counties averaging twenty-seven per cent—making a decrease, as will be seen, of about ten per cent. from the original wooded area.

This loss is almost entirely due to marketing the merchantable timber in the southern part of the State where the production of lumber and cooperage stock has been an important industry for many years. Owing to the exhaustion of the best grades of mature hard woods, the business is rapidly diminishing, and as the present supply is chiefly on lands not available for cultivation, the remaining area is not liable to further encroachments, and hence it follows that the problem of to-day is no longer a question of off-setting the destruction of forests at one end of the State, by cultivation in the other, but rather, that henceforth there will be a more uniform development, which is destined not only to restore the original area, but also to equalize the supply, so that every locality in the entire State shall be blessed with woodland shade and shelter.

The State of Illinois is three hundred and eighty-five miles in length, ranging from the latitude of Boston to that of Richmond, Va., and while the climate may not vary in an equivalent degree, the prolific soil produces an indigenous sylva ranging from the black cypress of the semi-tropic South to the tamarack of the far North; making a variety more than twice as great as that of all Europe.

A proper exhibit of this great forest wealth was not decided upon until the middle of August preceding the opening of the World's Columbian Exposition, and it is needless to say that thereupon every effort was put forth

to make a creditable showing within the limited remaining time.

In pursuance of this decision, a Superintendent was appointed and was afforded every facility to make the exhibit worthy of its surroundings in the magnificent Illinois Building, and through the valuable assistance of Commissioner Washburn and other members of the Board, the formal opening of the great Exposition found an artistically arranged exhibit of indigenous woods on appropriate rustic shelving, each specimen thoroughly finished, duly labeled, and the whole catalogued, as follows:

### Indigenous.

Genera.	Species.	Common Name.
Anonaceæ .....	Asimina triloba.....	Papaw .....
Anacardiaceæ .....	Rhus.....	Sumac.....
Betulaceæ .....	Betula rubra .....	Red Birch.....
Bignoniaceæ .....	Catalpa speciosa .....	Catalpa (Western) .....
Caprifoliaceæ .....	Viburnum prunifolium .....	Black Haw .....
Coniferæ.....	Juniperus Virginiana .....	Red Cedar .....
“ .....	Cupressus fastigiata.....	Cypress.....
Cornaceæ .....	Nyssa aquatica.....	Tupelo .....
“ .....	“ capitata .....	Yellow Gum.....
“ .....	“ uniflora .....	White Sweet Gum.....
“ .....	“ sylvatica.....	Black Gum.....
“ .....	Cornus florida.....	Dogwood.....
Cupuliferæ.....	Fagus ferruginea .....	Beech.....
“ .....	Ostrya Virginica.....	Hornbeam.....
“ .....	Castanea vesca.....	Chestnut.....
“ .....	Quercus obtusiloba.....	Post Oak.....
“ .....	“ alba.....	White Oak.....
“ .....	“ aquatica.....	Water Oak.....
“ .....	“ falcata.....	Spanish Oak.....
“ .....	“ tinctoria .....	Black Oak.....
“ .....	“ rubra .....	Red Oak.....
“ .....	“ prinoides.....	Chinquapin Oak .....
“ .....	“ macrocarpa.....	Burr Oak.....
“ .....	“ Michauxii.....	Basket Oak.....
“ .....	“ nigra.....	Black-Jack Oak.....
“ .....	“ lyrata.....	Overcup Oak.....
“ .....	“ coccinea .....	Scarlet Oak.....
“ .....	“ Phellos .....	Willow Oak.....
“ .....	“ bicolor .....	Swamp Oak.....
Ebenaceæ .....	Diospyros Virginiana.....	Persimmon.....
Hamamelaceæ .....	Liquidambar Styraciflua .....	Sweet Gum, Red.....

*Indigenous—Concluded.*

Genera.	Species.	Common Name.
Juglandaceæ.....	<i>Juglans nigra</i> .....	Black Walnut.....
"	" <i>cinerea</i> .....	Butternut.....
"	<i>Carya olivæformis</i> .....	Pecan.....
"	" <i>alba</i> .....	White Hickory, Shellbark..
"	" <i>sulcata</i> .....	Big Shellbark.....
"	" <i>tomentosa</i> .....	Black Hickory.....
"	" <i>porcina</i> .....	Pignut Hickory.....
Lauraceæ.....	<i>Sassafras officinale</i> .....	Sassafras.....
Leguminosæ.....	<i>Cercis Canadensis</i> .....	Red Bud.....
"	<i>Robinia pseudacacia</i> .....	Black Locust.....
"	<i>Gleditsia triacanthos</i> .....	Honey Locust.....
"	<i>Gymnocladus Canadensis</i> .....	Kentucky Coffee-tree.....
Magnoliaceæ.....	<i>Liriodendron tulipifera</i> .....	Tulip-tree, Yellow Poplar..
"	<i>Magnolia acuminata</i> .....	Cucumber-tree.....
Oleaceæ.....	<i>Fraxinus sambucifolia</i> .....	Black Ash.....
"	" <i>Americana</i> .....	White Ash.....
"	<i>Forestiera acuminata</i> .....	Privet.....
Platanaceæ.....	<i>Platanus occidentalis</i> .....	Sycamore.....
Rosaceæ.....	<i>Prunus serotina</i> .....	Wild Black Cherry.....
"	<i>Crataegus coccinea</i> .....	Red Haw.....
"	<i>Prunus Americana</i> .....	Wild Plum.....
"	<i>Pyrus angustifolia</i> .....	Crab Apple.....
"	<i>Amelanchier Canadensis</i> .....	June Berry.....
Rutaceæ.....	<i>Ptelia trifoliata</i> .....	Water Ash.....
"	<i>Xanthoxylum Americanum</i> .....	Prickly Ash.....
Sapotaceæ.....	<i>Bumelia lycioides</i> .....	Ironwood.....
Salicaceæ.....	<i>Populus alba</i> .....	Silver Poplar, S. Maple...
"	<i>Populus monilifera</i> .....	Cottonwood.....
"	<i>Populus grandidentata</i> .....	Poplar, White.....
"	<i>Salix nigra</i> .....	Black Willow.....
Sapindaceæ.....	<i>Acer nigrum</i> .....	Black Sugar Maple.....
"	<i>Acer dasycarpum</i> .....	Soft Maple, White.....
"	<i>Negundo aceroides</i> .....	Box Elder.....
"	<i>Acer saccharinum</i> .....	White Sugar Maple.....
"	<i>Acer rubrum</i> .....	Soft Maple, Red.....
"	<i>Æsculus glabra</i> .....	Buckeye.....
Simarubaceæ.....	<i>Simaruba glauca</i> .....	Paradise Tree.....
Tiliaceæ.....	<i>Tilia Americana</i> .....	Lind—Basswood.....
Urticaceæ.....	<i>Ulmus Americana</i> .....	White Elm.....
"	" <i>racemosa</i> .....	Hickory Elm.....
"	" <i>fulva</i> .....	Slippery Elm.....
"	" <i>alata</i> .....	Cork Elm, Wahoo Elm.....
"	<i>Morus rubra</i> .....	Red Mulberry.....
"	<i>Celtis reticulata</i> .....	Hackberry.....

Elder, Hazel, Spicewood, Wild Grape, etc., etc.

Owing to the limited time in which the collection had to be made, several kinds were unavoidably omitted, among which may be mentioned White Pine (Lake Co.), Yellow Pine (Union Co.), Birch, Wahoo, and other varieties, which were well represented, however, in the extensive display of cultivated wood, arranged and finished in the same uniform manner and catalogued as follows under the head of:

### Cultivated Timber.

Species.	Name.	Years.	Height. feet.	Diam- eter. inches
<b>ANONACEÆ.</b>				
<i>Asimina triloba</i> .....	Pawpaw.....			
<b>BETULACEÆ.</b>				
<i>Betula alba</i> .....	White Birch .....	18	50	9
<b>BIGNONIACEÆ.</b>				
<i>Catalpa speciosa</i> .....	Western Catalpa.....	10	22	5½
<b>CAPRIFOLIACEÆ.</b>				
<i>Viburnum prunifolium</i> .....	Black Haw .....			
<b>CONIFERÆ.</b>				
<i>Larix Europea</i> .....	European Larch.....	34	52	16
<i>Pinus sylvestris</i> .....	Scotch Pine.....	27	45	11
<i>Pinus Austriaca</i> .....	Austrian Pine.....	22	35	12
<i>Juniperus Virginiana</i> . ....	Red Cedar.....	46	28	7½
<i>Larix Americana</i> .....	American Larch.....	36	50	12
<i>Abies balsamea</i> .....	Balsam Fir .....	25	38	10
<i>Tsuga Canadensis</i> .....	Hemlock .....	22	33	7½
<i>Picea pungens</i> .....	White Spruce.....	19	36	8
<i>Pinus Banksiana</i> .....	Gray Pine.....	19	38	6
<i>Pinus resinosa</i> .....	Norway Pine .....	20	36	10½
<i>Abies excelsa</i> .....	Norway Spruce.....	25	40	9½
<i>Thuja occidentalis</i> .....	Arbor-vitæ .....	26	34	9
<i>Pinus strobus</i> .....	White Pine.....	32	50	18

*Cultivated Timber—Continued.*

Species.	Name.	Years.	Height. feet.	Diam- eter. inches
<b>CUPULIFERÆ.</b>				
<i>Ostrya Virginica</i> .....	Hop Tree.....	19	35	3½
<i>Quercus lyrata</i> .....	Burr or Over-cup Oak..	50	41	11
“ <i>alba</i> .....	White Oak .....	58	51	10½
“ <i>falcata</i> .....	Red Oak .....	54	66	10½
“ <i>nigra</i> .....	Black Oak.....	54	62	11
“ <i>palustris</i> .....	Pin Oak.....	54	80	13
“ <i>lyrata</i> .....	Over-cup Oak .....	61	65	11
“ <i>p. discolor</i> .....	Swamp White Oak.....	42	60	12½
“ <i>prinus palustris</i> ...	Chestnut Oak.....	43	40	6
<i>Fagus ferruginea</i> .....	Beech.....	33	40	9
<i>Castanea vesca</i> .....	American Chestnut ...	37	60	16
<i>Carpinus Caroliniana</i> .....	Water Beech.....	36	20	14
<b>EBENACEÆ.</b>				
<i>Diospyros Virginiana</i> .....	Persimmon.....			
<b>JUGLANDACEÆ.</b>				
<i>Juglans cinerea</i> .....	Butternut .....	40	46	10
<i>Carya alba</i> .....	Shellbark Hickory.....	59	60	.....
<i>Carya porcina</i> .....	Pignut Hickory .....	47	45	.....
<i>Juglans nigra</i> .....	Black Walnut.....	39	60	12
<b>LEGUMINOSEÆ.</b>				
<i>Gymnocladus Canadensis</i> ..	Ky. Coffee Tree .....	47	55	10
<i>Gleditschia triancanthos</i> ..	Honey Locust .....	46	51	18
<i>Robinia pseudacacia</i> .....	Black Locust .....	14	60	7
<i>Gleditschia aquatica</i> .....	Water Locust.....	12	40	4
<i>Robinia fragilis</i> .....	Yellow Locust .....	34	40	6
<b>SIMARUBACEÆ.</b>				
<i>Ailanthus glandulosa</i> .....	Ailanthus.....			
<b>OLEACEÆ.</b>				
<i>Fraxinus platycarpa</i> .....	Water Ash.....	51	72	9
“ <i>Americana</i> .....	White Ash.....	21	47	10
“ <i>quadrangulata</i> ...	Blue Ash.....	50	45	9
<b>PLATANACEÆ.</b>				
<i>Platanus occidentalis</i> .....	Sycamore.....	30	55	10½

*Cultivated Timber—Concluded.*

Species.	Name.	Years.	Height feet.	Diam- eter. inches
<b>ROSACEÆ.</b>				
<i>Pyrus Americana</i> .....	Mountain Ash.....	32	25	9
<i>Amelanchier Canadensis</i> ...	June Berry.....			
<i>Cratægus coccinea</i> .....	White Thorn, Red Haw.	29	15	4½
<i>Prunus serotina</i> .....	Wild Black Cherry.....	39	55	12
<i>Prunus Pennsylvanica</i> .....	Choke Cherry.....			
<i>Pyrus angustifolia</i> .....	Wild Crab Apple.....	28		7½
<b>RUTACEÆ.</b>				
<i>Xanthoxylum Americanum</i> .	Prickly Ash.....			
<b>SALICACEÆ.</b>				
<i>Populus monilifera</i> .....	Cotton-wood.....	52	82	8½
<i>Populus grandidentata</i> ...	Poplar.....	32		9
<i>Salix amygdaloides</i> .....	Water Willow.....	8		4½
<i>Populus tremuloides</i> .....	Quaking Asp.....	24		6
<i>Salix sericea</i> .....	Silky Willow.....	33	66	9
<i>Salix viminalis</i> .....	Basket Willow.....			
<i>Salix vitellina</i> .....	Yellow Willow.....	18	55	9½
<i>Populus balsamifera</i> .....	Balm of Gilead.....	16	60	11
<i>Populus alba</i> .....	Silver Poplar.....	33	60	10½
<b>SAPINDACEÆ.</b>				
<i>Æsculus glabra</i> .....	Horse Chestnut.....	40	35	6½
<i>Acer dasycarpum</i> .....	Soft Maple.....	26	60	11
<i>Acer saccharinum</i> .....	Rock or Sugar Maple...	30	50	6½
<i>Acer rubrum</i> .....	Red Maple.....	32	52	10
<i>Negundo aceroides</i> .....	Box Elder.....			
<b>SAPOTACEÆ.</b>				
<i>Bumelia lanuginosa</i> .....	Iron Wood.....	46	45	7½
<b>TILIACEÆ.</b>				
<i>Tilia Americana</i> .....	Basswood.....	33	58	13
<b>URTICACEÆ.</b>				
<i>Celtis reticulata</i> .....	Hackberry.....	39	45	10
<i>Maclura aurantiaca</i> .....	Osage Orange.....	22	30	6½
<i>Ulmus Americana</i> .....	White Elm.....	42	62	10
<i>Ulmus fulva</i> .....	Slippery Elm.....	33	58	11
<i>Morus rubra</i> .....	Mulberry.....	21	25	6

The material for this exhibit was chiefly collected by Commissioner Samuel Dysart, with A. R. Whitney, the veteran nurseryman, as his able assistant. The data as to age and dimensions of each tree were also supplied by those old settlers, which go far towards establishing the results of timber culture on open prairies.

To amplify the products of cultivated timber, a complete farm wagon was exhibited, constructed of twenty-five kinds of wood, all of which were grown from the seed, on a prairie farm in Lee county. This highly finished collective showing of what can be produced on a single farm, served as a center piece to the general exhibit, and being so far as known the first vehicle on this continent made of cultivated timber, proved the leading attraction of the entire department.

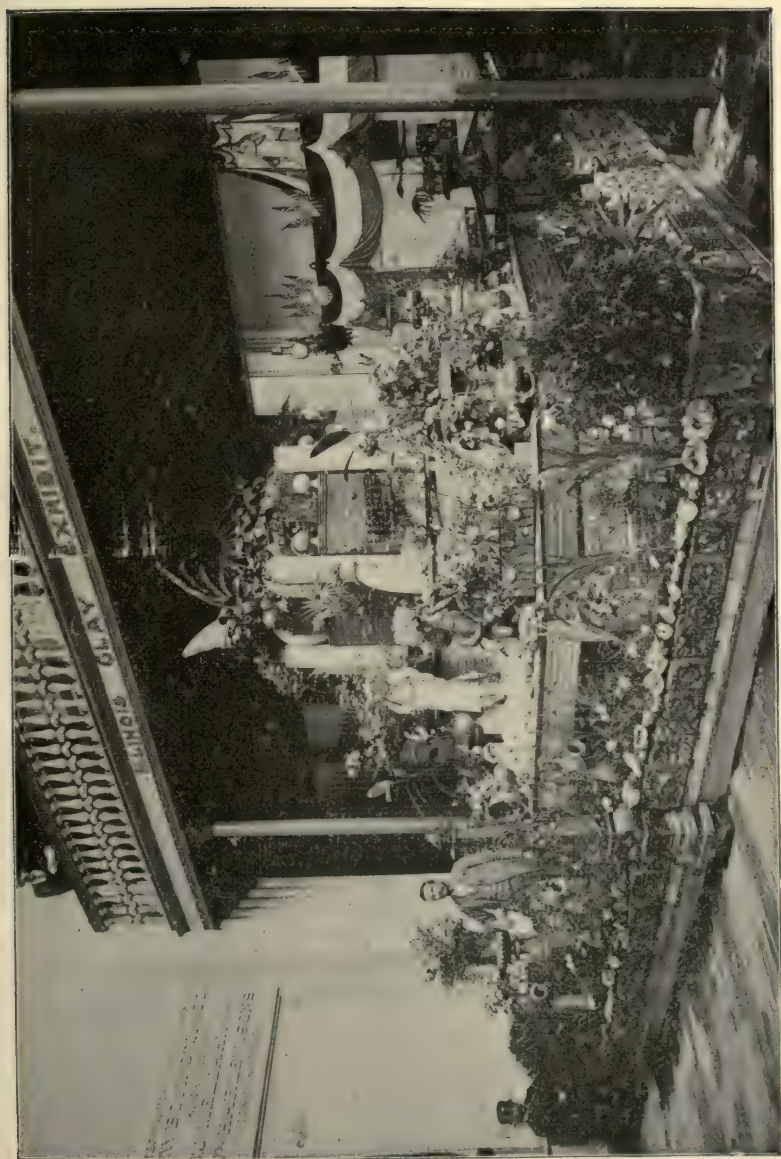
Aside from this wagon the display consisted of seventy-three specimens, which could have been greatly augmented in number had time permitted to canvass the State. The difficulty seemed to be that the dweller of the prairie planted the rarer specimens for shade and ornamentation, and hence could hardly be expected to part with such trees just as the object and reward were developing into beautiful perfection. It is a pleasure, however, to record the fact that wherever duplicates could possibly be spared, not a single owner was in the least disposed to take advantage of the situation, but invariably made personal sacrifices to further the aims and purposes of the Commission in making a forestry display worthy of the greatest agricultural State of the Union.

The history of forests and forestry in Illinois is thus briefly brought down to the Columbian year, and after striking the balance between the present and the past, we find, upon adding all other aborescent growth, that the leaf surface of the State has suffered no loss, and being

evenly distributed, its beneficial influences upon climate, water supply and soil, are thereby greatly augmented. The loss is in forest area, quality and financial results, and to retrieve this deficiency in the shortest possible time, tree planting should be confined to fruit-bearing timber trees, which would restore the income without loss of area, and yet more than double the commercial value of trees ordinarily cultivated.

Of the trees indigenous to the State, will be found the black walnut, pecan, butternut and hickory, all of which, when once established, will thrive without care, will grow rapidly, and are naturally free from insects enemies; the product, therefore, must be nearer a clear gain than anything else raised on the farm. That little or no attention has been paid to this promising branch of arboriculture is a most singular and surprising fact, especially since it opens an entirely new field, in which the propagation, improvement and origination of new varieties of fruit by engrafting or budding, may be practiced with unquestioned success and with the absolute certainty of remunerative results. The product is a delicacy equal to the fruit of the orchard, commanding a price at all times so liberal as to justify unusual care in its cultivation; and the timber of the tree itself is invariably the most valuable and costly in our market.

In conclusion, we can only dedicate the important task of re-afforestation to the farming community. Others may suggest, but upon the tillers of the soil devolves the duty of conserving by practical means the forestal interests of the great State of Illinois. With unbounded faith in their devotion to this work, we behold with prophetic vision, future generations blessing the memory of those who rebuilt "God's first temples."



ILLINOIS CLAY EXHIBIT.



## THE CLAY EXHIBIT.

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BY A. O. LOY.

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**T**HE Illinois Clay Exhibit, as shown by the illustration, consisted of a space 21x21 feet. The space was enclosed with a rustic fence made from tile and terra cotta, covered with ferns, vines and flowers. The pyramid, which stands in the center of the space, is sixteen feet in diameter, octagon in shape, veneered with fine pressed brick of many colors, shapes and sizes, and decorated with tile, terra cotta, lawn vases, window boxes, flower pots, rustic statuary, etc., with growing plants, vines and flowers.

A rule of the National Commission provided that no manufactured goods should be shown in State buildings. This exhibit was not intended for a display of manufactured goods, but a place built from manufactured clay goods on which to show Illinois clays. Clays of many kinds and qualities, in glass jars, are placed on the shelves of the pyramid.

Among the collection are clays suitable for the manufacture of paving, common, pressed, ornamental and fire-brick; terra cotta of many colors; sewer pipe, fire-proofing, drain tile, pottery, flower pots, rustic statuary, white granite and encaustic tiles.

Over 80,000 persons are employed yearly in the factories of this State. Seven hundred million brick were manufactured in the vicinity of Chicago in 1892, while in other cities in the State, millions of building and

paving brick of the finest quality were made. We have large terra cotta works in the State; also sewer pipe and fire-brick factories. We have five hundred drain tile factories, many of which are run twelve months each year, and are even then unable to supply the demand. There is an unlimited quantity of clay in our State, which, for quality, will compare favorably with the clays of any State in the Union.



STATE LABORATORY OF NATURAL HISTORY AND UNIVERSITY OF ILLINOIS, CHAMPAIGN, ILLINOIS.



## STATE LABORATORY OF NATURAL HISTORY.

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BY S. A. FORBES.

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THE exhibit of the zoölogy of the State of Illinois was made at the Exposition by the aid of the Illinois State Laboratory of Natural History, an institution devoted to a survey of the zoölogy and cryptogamic botany of Illinois with special reference to educational and economic ends. With this establishment the office of the Illinois State Entomologist is now closely associated, the Director of the Laboratory being, in fact, the official Entomologist also, and the exhibit of this office was consequently made as a feature of the Laboratory display.

The Natural History Exhibit was selected and arranged with a view to displaying the results and methods of investigation actually accomplished and in progress under State authority, due regard being had to a popular attractiveness of the material and its effectiveness for display. The exhibit was thus limited to specimens of the birds, fishes and insects of the State.

The entomological exhibit was made in connection with a model entomologist's office, which contained five hundred and forty square feet in one room, with an annex twenty feet long by eleven feet wide for an insectary. Into these rooms was put a select and carefully arranged equipment for first class work in all departments of technical and economic entomology, includ-

ing furniture, a section of the laboratory library and of the library catalogue, record books with examples of the records, specimens prepared and arranged in the various ways useful for reference, apparatus for collecting and experiment, microscopes, a drawing equipment and the like, making of the whole a model establishment which, it was believed, might be profitably studied by any economic entomologist, foreign or American. In the insectary, apparatus for the breeding and rearing of insects of injurious habit was placed, as well as for the cultivation of the plants subject to insect injuries upon which experimental methods might be demonstrated.

The special exhibits made in this department included a collection of sixteen hundred species of common Illinois insects, so selected as to present a correct general idea of the insect life of the State; separate collections of insects injurious to corn, to wheat, to the apple, and to the strawberry in Illinois; a special exhibit of the food of one robin for one year; a set of insects ascertained to have been eaten by birds; a similar series eaten by fishes; a set of butterflies arranged with a view to illustrating the geographical distribution of insect species in Illinois; and a set of Illinois insects illustrating the work of the laboratory in supplying entomological material to the high schools of the State.

The ornithological exhibit was made in four series: (1) A collection of the game birds of the State mounted as dead game; (2) a series of biological groups mounted in various naturalistic attitudes, with natural accessories indicating haunts, habits and the like; (3) a general collection of all the birds of the State grouped according to their distribution within the State at different seasons of the year, and (4) a set of the eggs of birds breeding in Illinois.

Our ichthyology was illustrated by one hundred and fifteen species of fish from various parts of the State, collected by the laboratory force and exhibited in alcohol.

To this general account the following detailed statement may be added.

### Ornithological Exhibit.

Winter Residents of Southern Illinois.....	108 specimens.
“ “ throughout Illinois .....	141 “
Stragglers in Illinois.....	24 “
Summer Residents throughout Illinois.....	207 “
Winter Residents of Northern Illinois.....	44 “
Summer “ “ “ .....	59 “
“ “ Southern Illinois.....	38 “
Migrants passing through Illinois .....	77 “
Common Game Birds of Illinois mounted as dead game....	53 “
A Group of Wild Turkeys mounted with natural accessories .....	6 “
A Group of Prairie Chickens mounted with natural accessories .....	4 “
A Group of Crossbills mounted with natural accessories....	8 “
A Group of Yellow-bellied Sapsuckers, with nest and eggs.	4 “
“ Little Green Herons, with nest and eggs.....	2 “
<hr/>	
Total number of birds exhibited.....	775 “

One hundred and twenty-five clutches of birds' eggs, representing as many species of birds nesting in Illinois, were also shown, the total number of eggs in these clutches being five hundred and twenty-five.

## Entomological Exhibit.

	Pinned Specimens.	Vials.	Drawings.
Illinois Insects injurious to Apple .....	240	160	57
"          "          Corn .....	150	85	22
"          "          Wheat .....	53	43	9
"          "          Strawberry .....	52	20	13
Insects in food of birds .....	195	24	.....
"          "          fishes .....	91	9	.....
Geographic distribution of Illinois Butterflies.	184	.....	.....
Illinois Insects as furnished to High Schools of Illinois .....	459	.....	.....
Common Insects of Illinois:			
Dermaptera .....	4	.....	.....
Orthoptera .....	215	.....	.....
Platyptera .....	12	.....	.....
Odonata .....	73	.....	.....
Plecoptera .....	8	.....	.....
Hemiptera .....	566	.....	.....
Neuroptera .....	20	.....	.....
Mecaptera .....	4	.....	.....
Trichoptera .....	3	.....	.....
Coleoptera .....	2,662	.....	.....
Diptera .....	541	.....	.....
Lepidoptera .....	1,058	.....	.....
Hymenoptera .....	1,016	.....	.....
Totals .....	7,606	287	101

In addition to the above there were exhibited about 3,000 specimens of Lepidoptera and Coleoptera, twenty boxes each, from the standard collection of the State Laboratory. Twenty-four racks of vials of alcoholic specimens were shown with these.

The special exhibit of the food of the robin for one year consisted of 5,481 pinned specimens of insects, 80 tubes, each fifteen inches in length, containing alcoholic specimens, and 38 shorter tubes and vials of alcoholic specimens, besides vials and tubes containing fruits and seeds.

The furniture of the Entomologist's office, comprised two office desks, four plain work tables, three tables with specimens cases, a table for reference books and record

books, two wall cases for specimens, a large book case, two reagent cases, one typewriting machine and desk, one letter press and stand, a small printing press and case of type, a sink, and four chairs.

In the book case was displayed a section of the library of the State Laboratory of Natural History, the books selected being entomological, and including serial publications, periodicals, monographs, reference books, pamphlets, etc., to the number of about five hundred volumes. A complete set of the publications of the Laboratory and of the State Entomological Reports was also furnished.

Under the head of working apparatus, there were exhibited in this room one compound microscope and accessories, two dissecting microscopes and accessories, two large microtomes, a complete outfit for collecting insects, sets of bottles, vials and reagents for preserving insects, apparatus for inflating larvæ, and that used in mounting and preserving insects.

In the insectary, adjoining the office room, were sixty large and small breeding cages, with glass fronts and gauze sides; forty glass jars of various sizes and shapes to be used as breeding cages, and two gauze-covered cages suitable for outdoor use. These were arranged on shelves, and on a table covered with sand. There were also in this room a work table with an Arnold steam sterilizer, large culture jars, funnels, and other apparatus used in the culture of fungi causing insect disease.

The zoölogical display was made in accordance with detailed plans prepared by Professor S. A. Forbes, Director of the State Laboratory of Natural History, and approved by the Illinois Board of World's Fair Commissioners. The execution of these plans was confided, under the general supervision of the Director of the Laboratory, to Mr. C. F. Adams, of the University of Illinois, for the birds, and to Mr. H. E. Summers, for the insects.

The material for the ornithological exhibit was chiefly obtained by special collections made for this purpose during the winter of 1891 and the spring and summer of 1892, by parties sent out by the Laboratory, and mounted by Mr. Adams himself. As it was quite impossible to make a complete collection of the birds of the State within so short a time, the deficiencies remaining were supplied by selections made from the museums of the University of Illinois, at Champaign, and of the State Board of Agriculture, at Springfield, and by purchase of skins from taxidermists.

The entomological exhibit was likewise provided in part from special collections made by Laboratory employés, and by assistants especially engaged for the purpose, and in still greater part from the cabinets of the State Laboratory of Natural History and of the University of Illinois.

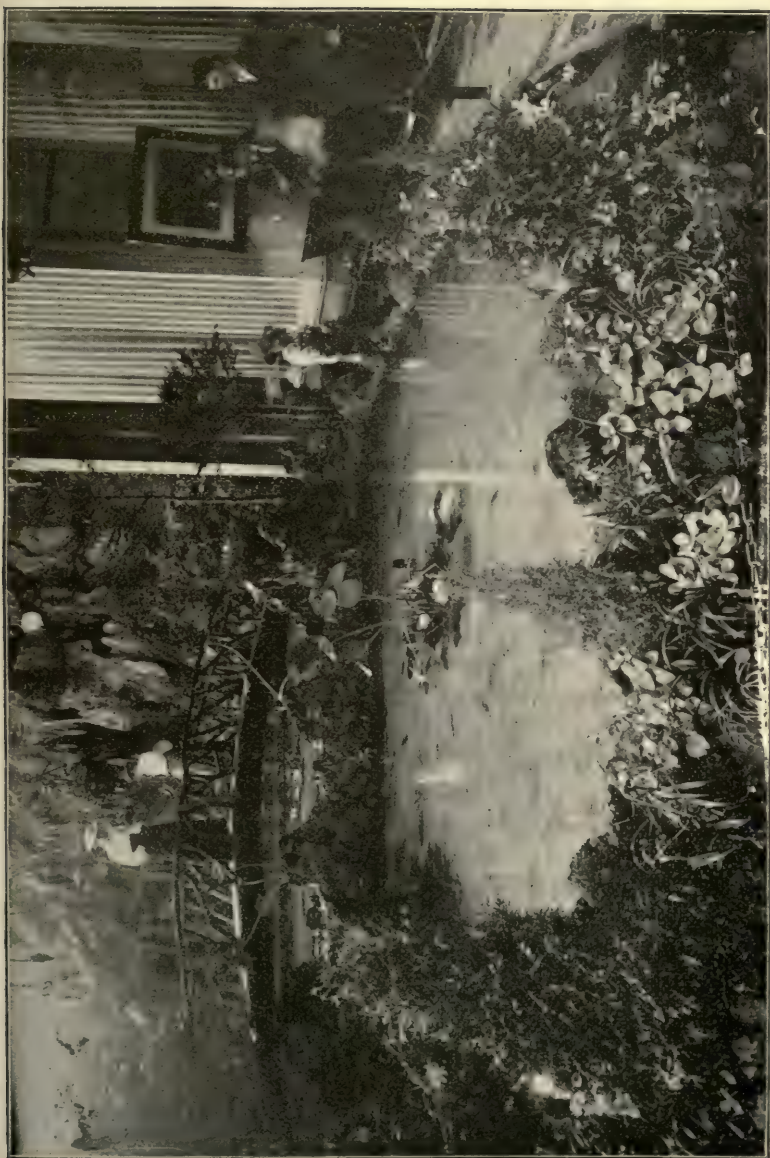
The beautiful colored drawings distributed through the entomological exhibit, to illustrate species too small to be well seen by the naked eye, were made at the State Laboratory for the purpose by Miss Lydia M. Hart, the special artist of the establishment.

The ichthyological collections were all made during the season of 1892, by assistants sent from the Laboratory, Mr. J. E. Hallinen, a student of the University, doing the greater part of the field and laboratory work.



CULTIVATED TIMBER AND, FISH EXHIBIT.





FISH EXHIBIT.



## FISH EXHIBIT.

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BY S. P. BARTLETT.

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FISH culture and fish protection are, like a number of other interests fostered by the State, the outgrowth of the needs of the people, and only when the waters were found to be gradually but surely becoming depleted, was the attention of our law makers attracted in that direction. Previous to 1878, fish laws were practically unknown in our State and fish were taken by anybody in any way. The demands of the various markets for that character of food increasing, induced hundreds along the rivers and lakes to embark in market fishing as a business, and the result was, that, without thought for the morrow, the product of the waters was taken, regardless of season or condition, and as the fish were most easily taken during the spawning season, millions found there way to our own and foreign markets at that season. This continuing from year to year made a marked decrease in the supply of fish, particularly in the inland lakes and streams, until about the time mentioned above (1878-9), people began to realize that a few years of such wholesale destruction would entirely deplete our waters of the better varieties of our native food fishes.

As an illustration of the condition of the waters at that time one case in point might briefly be cited. The Fox and Rock rivers once produced plentifully the channel cat fish. In 1878, few if any specimens of this particular fish were ever taken in these rivers. The black

croppie, or strawberry bass, also, was almost extinct, and all varieties of fish scarce, and had it not been for the magnificent breeding grounds in which those rivers head, there is but little doubt but that they would ultimately have been utterly depleted. It is but fair to add, however, that the dams along both of these rivers for years unprovided with fishways, had much to do with the scarcity of fish, the rivers being entirely dependent on the resources of the spawning grounds, and cut off by these dams from the natural supply from the greater rivers into which they emptied. This has since been corrected by the enactment of the Fishway law.

In 1878-9 the Legislature undertook to make the first fish laws for the protection of fish. Hon. L. B. Crocker, of Mendota, championed the cause, making a very hard fight to obtain even a recognition in the way of an attempt at protection, and the whole interest was fought from every section of the State, the majority of the people holding that it was an interference with the vested rights of the people to take fish when and where they pleased. The Fish Commission originated during the same session, and with an entirely new field to develop, took up their work. Each successive legislature gave additional encouragement, in the way of better laws and better appropriations for the Commission, in its work of distribution and protection, until almost every stream in the State has reached its normal condition as to supply of native food fishes, with an addition of other varieties.

Perhaps the extent and value of the work of the Fish Commission was not fully appreciated by the majority of the people of the State who were not personally cognizant of its practical results. An opportunity of demonstrating these results publicly was offered when the bill which made the appropriation for State exhibits at the

World's Fair was passed. It contained among its provisions a clause which made it obligatory on the part of the Board of Fish Commissioners to make an exhibit of live fish under the supervision of the Illinois Board of World's Fair Commissioners, which was a recognition of the interest gratifying in the extreme to the Board of Commissioners. The greatest latitude was given the Fish Commission by the World's Fair Board through its Committee on Natural History, and the result was an exhibit of live fish under conditions that, so far, has never been equaled. The use of the ordinary aquarium was proposed, but upon figuring the expense necessary to handle and care for them in that way, and the unsatisfactory results heretofore obtained by that method of exhibit, it was thought desirable to introduce newer features and put the fish under as nearly natural conditions as possible. In order to accomplish this, experiments were made in the keeping and care of fish in shallow ponds, so arranged as to give a full view of the fish, and at the same time to furnish surroundings as nearly natural as practicable. Plans for such an exhibit were proposed by the Commission to the Committee, and as before stated, sufficient latitude was given the Commission to reproduce, in working order, the plans submitted. The space assigned them was one of the most desirable in the State Building. The plans were shown Mr. J. B. Mora, a French architect, who suggested a beautifully elaborated scenic finish, which was adopted by the Board, and the contract was let to Mr. Mora to arrange the exhibit according to such plans. The exhibit differed from anything of the kind ever made before for the purposes of a live fish exhibit, and consisted of a miniature mountain, down the sides of which fell, in cascades, pure filtered water into the several pools formed at various heights along its sides, until all the water

met at its base in a beautiful miniature lake. This lake was crossed by a rustic bridge, from which the observer could see all the fish in any of the pools. Around the edges of the lake and pools were planted various aquatic plants usually found in such places. The mountain itself, covered with cedars, shrubs and flowers, as a whole presented one of the most attractive exhibits of the Building, if not of the Fair. In the lake a full carload of fish could be comfortably cared for. The fish used in the exhibit were placed there in March and taken out in November. The loss was but a small per cent. of the whole, showing a wonderfully healthful condition, particularly when it is considered that the water was filtered, thus depriving it of a very considerable amount of the natural food supply usually obtained from water in its natural state. The freedom from fungus, the greatest enemy of fish in aquaria, was particularly noticed; in fact, a more complete demonstration of the value of surface area in aquaria exhibits could not have been made. The exhibit as a whole was a great educator, showing as it did to thousands the fishes of this State utilized by the Commission. The greater portion of the people of the State have but little knowledge, as a general thing, of what our waters contain. Few, perhaps, had ever seen a number of the varieties under conditions so nearly natural. The live fish exhibit was, in every sense, a gratification to those who were responsible for it, and was, without doubt, appreciated by those who saw it.

The Fish Commission, as first organized, consisted of the following named members:

N. K. Fairbank, President, Chicago, 3 year term.

S. P. Bartlett, Secretary, Quincy, 2 year term.

J. M. Briggs, Kankakee, 1 year term.

At the expiration of Mr. Briggs' term, Mr. S. P. McDole, of Aurora, was appointed to succeed him. His term was for three years. He, in turn, was succeeded at the expiration of his time, by Major George Breuning, of Centralia. In July, 1893, the entire Commission was changed, and the following named gentlemen were appointed to succeed the old Board:

Mr. Richard Roe, President, East St. Louis.

Mr. George W. Langford, Secretary, Havana

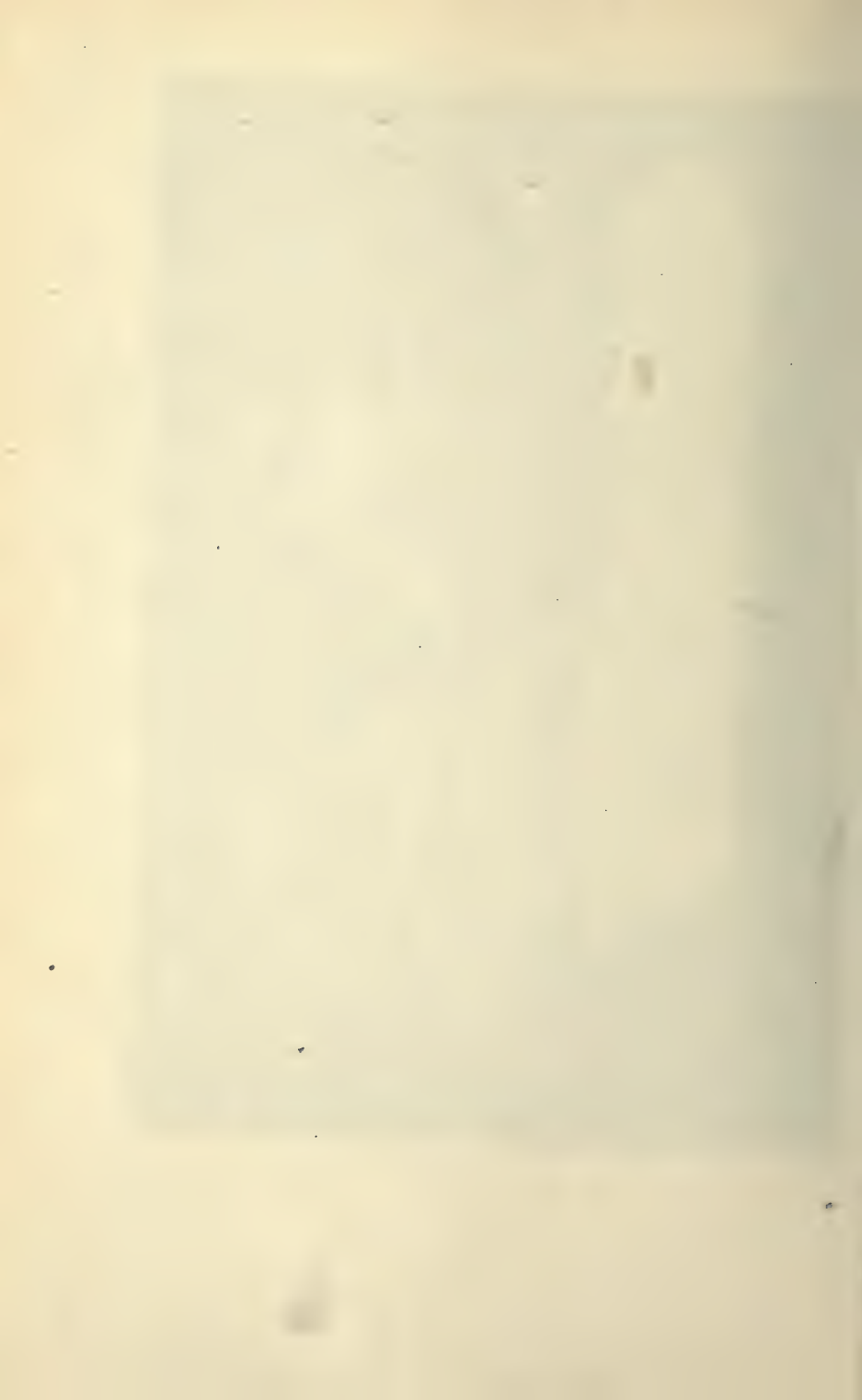
Mr. O. D. Sickler, Geneva.





PICTURE ON WALL OF AGRICULTURAL EXHIBIT.

Made of grains and grasses, representing a typical Illinois farm.



## AGRICULTURAL EXHIBIT.

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**T**HE Illinois Agricultural Exhibit, occupying space on the first floor in the northwest corner of the Illinois State Building, and on the first floor, near the center, of the Agricultural Building, was given a wide scope, when the law provided for "a full and complete collection of all the cultivated products in the several branches of agriculture, in illustration of the widely different conditions of soil and climate under which rural husbandry is practiced in the various parts of the State."

Your Committee found it no easy task to provide for all these requirements in making a representative and attractive exhibition in both these buildings, which should maintain the credit of this agricultural state.

Early in 1891 were laid plans for an agricultural exhibit by the State Board of Agriculture, and in August of the same year the Committee on Agriculture of the Commission began the work of securing an exhibit as described by the law quoted above.

Each member of the Commission was requested to collect from the district in which he resided whatever he could that was of merit of the products of the farm. This resulted in securing a very valuable collection from a number of counties.

It was determined to offer prizes to be competed for at the State Fair in 1892, for the best collection of farm products. The said products were to become the property of the State Board of Agriculture and the Illinois Commission. It was finally decided to offer three series of prizes, one for each of the three great divisions of the State, northern, central and southern. These prizes were

\$250, \$150 and \$100 for the best displays by counties, from each grand division, and \$50 for each county display which did not secure one of the above prizes. At no time in the history of fairs in this State have such displays in quantity, quality and variety been brought before the eyes of the visiting people. Probably State pride had much to do with this immense contribution of the wealth of farm production, representing a variety and profusion of products such as could only be produced in the wide range of climate and varied soils this State affords.

As many of these products as were of easy preservation were retained for use in making the renowned Illinois Agricultural Exhibit.

Your Committee, having at least a faint idea of the value to the many visitors from all nations at the great Columbian Show of presenting to their view a picture of a typical Illinois farm home, determined to bring out the same in a form as yet never undertaken, by making it entirely of grains and grasses. This required weeks and months of patient toil by the skillful hands of Illinois men and women, and an immense amount and a great variety of material. This picture, 24 by 32 feet, with a four-foot frame, with its draped curtain, requiring 125 varieties of grains and grasses, when completed (without the use of painter's brush) evidenced the fact that the Committee planned more wisely than it knew; for during the entire Columbian Exposition possibly no single exhibit was inquired after oftener or received more of written and verbal commendation.

Early in 1893, contracts were let for building the pavilion, shelving and other necessary structures for the display in as artistic form as possible of the immense amount of material that had already been stored in the building and that was waiting shipment from other

points. These structures again were decorated with such material as only Illinois soil, sunshine and rain could produce, bringing out an effect that prompted many expressions of surprise and delight; for which effect much credit is due the artist employed to design and superintend the construction of this feature of the exhibit.

The receipt of the products of the farm and garden of the crop of 1893 began soon after the opening of the Fair, and was continued during the entire exhibition, both from plantings made at stations about 25 miles apart through the length of the State, and from collections in nearly every county of the State. The plantings demonstrated the fact that the season of maturity progressed from south to north at the rate of about 12 miles per day; that the yield per acre of corn and potatoes increased from south to the central, and diminished from central to the northern parts of the State; that oats increased in yield from south to north, while the reverse was true of winter wheat. Selected ears of corn grown in the southern division of the State weighed  $17\frac{1}{4}$  ounces two months after harvesting, in central Illinois 14 ounces, and in northern Illinois  $11\frac{1}{4}$  ounces.

The height of selected stalks diminished from 16 feet and 4 inches in the southern to 14 feet and 2 inches in the central, and 12 feet and 2 inches in the northern division. A portion of the decrease in growth of cereals and vegetables from south to north must be attributed to the fact that the rainfall from May 1 to September 1 was unusually light (7.03 inches at the Agricultural Experiment Station), and as most of this was in May and but little of it later in the season, the northern portions of the State were at a disadvantage on account of their crops maturing later.

To the ordinary visitor the exhibit of non alcoholic products of Indian corn was a source of great surprise.

This consisted of thirty different articles especially adapted for the use for which each was intended. For this attractive display many thanks are due the Chicago Sugar Refining Co.

Article 2 of the act creating the Illinois Board of World's Fair Commissioners provided among other things for "an exhibit illustrating the entire system of the inspection of the several varieties of grain as established by the State Railroad and Warehouse Commission and practised by the State Grain Inspection Department."

In March, 1893, the Commission placed this exhibit under the care of the Agricultural Committee and immediately under the direction of Mr. Geo. P. Bunker, Chief Inspector; they proceeded to erect, in space immediately adjoining the Agricultural display, a diminutive car for the purpose of showing the practical workings of the system of grain inspection, an inspector's office, a series of shelves and boxes for showing the various grades of grains as inspected, and a desk on which was placed a complete set of inspectors' books, showing the manner of keeping the record of the 246,726,243 bushels of wheat, corn, oats, rye and barley inspected in, and the 107,917,619 bushels inspected out of the Chicago market in the year 1892.

This exhibit was not only attractive in its general appearance, but was one of much interest to farmers, dealers in grain and others interested in our cereal productions. This wonderful accumulation of grain in one city is evidence that not all exchanges on the Board of Trade are fictitious.

Illinois has many great things to boast of in comparison with her sister States, but if she was judged alone from her wealth in agriculture as shown in the extent, variety and quality and in the manner in presenting the

agricultural display to the eyes of an admiring public, the verdict must be one that would not lessen the pride of any citizen of this greatest of States.

While no time or expense was spared to make it the best of all the grand displays of the products of the farm and garden at the Columbian Exposition, yet a handsome sum was left in the hands of the State Treasurer to the credit of the committee in charge.

Appended will be found a list of articles that were placed on exhibition and used in decoration of the crop of 1892. A list of the products grown in 1893 would be largely a duplication of this with the addition of every variety of vegetable known to this climate in its season, and such miscellaneous products as cotton, tobacco, cow peas, hemp, etc.

### Native and Cultivated Plants of Illinois,

EXHIBITED IN THE ILLINOIS BUILDING AND IN THE ILLINOIS PAVILION IN  
THE NATIONAL AGRICULTURAL BUILDING.

#### Grass Family: Gramineæ.

<i>Common Name.</i>	<i>Botanical Name.</i>
1. Fresh Water Cord Grass . . . . .	<i>Spartina cynosuroides</i> . . . . .
2. No name . . . . .	<i>Paspalum setaceum</i> . . . . .
3. Crab or Finger Grass . . . . .	<i>Panicum sanguinale</i> . . . . .
4. Old Witch Grass . . . . .	<i>Panicum capillare</i> . . . . .
5. Panic Grass . . . . .	<i>Panicum autumnale</i> . . . . .
6. " " . . . . .	<i>Panicum agrostoides</i> . . . . .
7. " " . . . . .	<i>Panicum mattatum</i> . . . . .
8. " " . . . . .	<i>Panicum virgatum</i> . . . . .
9. " " . . . . .	<i>Panicum latifolium</i> . . . . .
10. " " . . . . .	<i>Panicum scoparium</i> . . . . .
11. " " . . . . .	<i>Panicum depauperatum</i> . . . . .
12. " " . . . . .	<i>Panicum dichotomum</i> . . . . .
13. Barn Yard Grass . . . . .	<i>Panicum Crus-galli</i> . . . . .
14. Fox Tail . . . . .	<i>Setaria glauca</i> . . . . .
15. Green Fox Tail . . . . .	<i>Setaria viridis</i> . . . . .
16. Millet or Hungarian . . . . .	<i>Setaria Italica</i> . . . . .
17. Hedge Hog or Burr Grass . . . . .	<i>Cenchrus tribuloides</i> . . . . .
18. White Grass . . . . .	<i>Leersia Virginica</i> . . . . .

## Native and Cultivated Grasses of Illinois—Continued.

Common Name.	Botanical Name.
19. Rice Cut Grass.....	<i>Leersia oryzoides</i> .....
20. Catch Fly.....	<i>Leersia lenticularis</i> .....
21. Indian Rice, Water Oats .....	<i>Zizania aquatica</i> .....
22. Beard Grass, Blue Stem or Blue Joint .....	<i>Andropogon furcatus</i> .....
23. Little Blue Joint .....	<i>Andropogon scoparius</i> .....
24. Indian Grass, Wood Grass.....	<i>Chrysopogon nutans</i> .....
25. Johnson Grass .....	<i>Sorghum Halapense</i> .....
26. Canary Grass.....	<i>Phalaris Canariensis</i> .....
27. Reed Grass.....	<i>Phalaris arundinacea</i> .....
28. Ribbon Grass.....	<i>Phalaris plecta</i> .....
29. Triple Awned Grass .....	<i>Aristida gracilis</i> .....
30. " " " .....	<i>Aristida oligantha</i> .....
31. " " " .....	<i>Aristida tuberculosa</i> .....
32. Poreupine Grass.....	<i>Stipa spartea</i> .....
33. Mountain Rice .....	<i>Oryzopsis melanocarpa</i> .....
34. Drop Seed Grass.....	<i>Muhlenbergia sobolifera</i> .....
35. " " " .....	<i>Muhlenbergia glomerata</i> .....
36. " " " .....	<i>Muhlenbergia Mexicana</i> .....
37. " " " .....	<i>Muhlenbergia sylvatica</i> .....
38. " " " .....	<i>Muhlenbergia Willdenovii</i> .....
39. " " " .....	<i>Muhlenbergia diffusa</i> .....
40. " " " .....	<i>M. diffusa</i> crossed with <i>M. Mexicana</i>
41. No name .....	<i>Brachyelytrum aristatum</i> .....
42. Timothy .....	<i>Phleum pratense</i> .....
43. Meadow Fox Tail .....	<i>Alopecurus pratensis</i> .....
44. Rush Grass .....	<i>Sporobolus asper</i> .....
45. " " .....	<i>Sporobolus heterolepis</i> .....
46. " " .....	<i>Sporobolus cryptandrus</i> .....
47. " " .....	<i>Sporobolus vaginæflorus</i> .....
48. Red Top .....	<i>Agrostis arachnoides</i> .....
49. " " .....	<i>Agrostis vulgaris</i> var. <i>alba</i> .....
50. Thin Grass.....	<i>Agrostis perennans</i> .....
51. Hair Grass .....	<i>Agrostis scabra</i> .....
52. Wood Reed Grass .....	<i>Cinna arundinacea</i> .....
53. Blue Joint.....	<i>Calamagrostis Canadensis</i> .....
54. Reed Bent Grass .....	<i>Calamagrostis longifolia</i> .....
55. Wild Oat Grass .....	<i>Danthonia spicata</i> .....
56. Muskit Grass.....	<i>Bouteloua oligostachya</i> .....
57. Muskit Grass .....	<i>Bouteloua hirsuta</i> .....
58. Muskit Grass .....	<i>Bouteloua racemosa</i> .....

*Native and Cultivated Plants of Illinois—Concluded.*

<i>Common Name.</i>	<i>Botanical Name.</i>
59. Dog's Tail or Wire Grass.....	<i>Eleusine Indica</i> .....
60. Sand Grass .....	<i>Triodia purpurea</i> .....
61. No name.....	<i>Diplachne fascicularis</i> .....
62. Reed Grass.....	<i>Phragmites communis</i> .....
63. No name.....	<i>Arundo Donax</i> .....
64. " .....	<i>Koeleria cristata</i> .....
65. " .....	<i>Eatonia obtusata</i> .....
66. " .....	<i>Eragrostis reptans</i> .....
67. " .....	<i>Eragrostis major</i> .....
68. " .....	<i>Eragrostis pilosa</i> .....
69. " .....	<i>Eragrostis Purshii</i> .....
70. " .....	<i>Eragrostis pectinacea</i> .....
71. Orchard Grass .....	<i>Dactylis glomerata</i> .....
72. Low Spear Grass.....	<i>Poa annua</i> .....
73. Wire Grass, English Blue Grass.....	<i>Poa compressa</i> .....
74. False Red Top.....	<i>Poa serotina</i> .....
75. June Grass, Kentucky Blue Grass.....	<i>Poa pratensis</i> .....
76. Spear Grass .....	<i>Poa sylvestris</i> .....
77. Fowl Meadow Grass.....	<i>Glyceria nervata</i> .....
78. Reed " " .....	<i>Glyceria grandis</i> .....
79. Fescue Grass .....	<i>Festuca Myurus</i> .....
80. " .....	<i>Festuca tenella</i> .....
81. " .....	<i>Festuca nutans</i> .....
82. Taller or Meadow Fescue .....	<i>Festuca elatior</i> .....
83. Wild Chess .....	<i>Bromus Kalmii</i> .....
84. Cheat or Chess.....	<i>Bromus secalinus</i> .....
85. No name.....	<i>Bromus ciliatus</i> .....
86. Common Darnel or Rye Grass....	<i>Lolium perenne</i> .....
87. Couch or Quick Grass.....	<i>Agropyrum repens</i> .....
88. No name.....	<i>Agropyrum tenerum</i> .....
89. Squirrel Tail Grass.....	<i>Hordeum jubatum</i> .....
90. No name.....	<i>Hordeum pratense</i> .....
91. Wild Rye .....	<i>Elymus Virginicus</i> .....
92. " .....	<i>Elymus Canadensis</i> .....
93. " .....	<i>Elymus striatus</i> .....
94. Bottle Brush Grass.....	<i>Asprella Hystrix</i> .....

## Sedge Family: Cyperaceæ.

GRASS-LIKE OR RUSH-LIKE HERBS, WITH FIBROUS ROOTS, MANY OF THEM  
COMMONLY CALLED SLOUGH GRASS.

	<i>Common Name.</i>	<i>Botanical Name.</i>
95.	Sedge.....	<i>Cyperus diandrus</i> .....
96.	" .....	<i>Cyperus Schweinitzii</i> .....
97.	" .....	<i>Cyperus strigosus</i> .....
98.	" .....	<i>Cyperus ovularis</i> .....
99.	Spike Rush.....	<i>Eleocharis ovata</i> .....
100.	" .....	<i>Eleocharis palustris</i> .....
101.	" .....	<i>Eleocharis rostellata</i> .....
102.	" .....	<i>Eleocharis acicularis</i> .....
103.	Sedge.....	<i>Fimbristylis capillaris</i> .....
104.	Bull Rush, or Club Rush.....	<i>Scirpus pungens</i> .....
105.	Great Bull Rush.....	<i>Scirpus lacustris</i> .....
106.	River Club Rush.....	<i>Scirpus fluviatilis</i> .....
107.	Rush.....	<i>Scirpus atrovirens</i> .....
108.	Wool Grass .....	<i>Eriophorum cyperinum</i> .....
109.	Twig Rush.....	<i>Cladium mariscoides</i> .....
110.	Nut Rush .....	<i>Scleria triglomerata</i> .....
111.	Sedge.....	<i>Carex lurida</i> .....
112.	" .....	" <i>Schweinitzii</i> .....
113.	" .....	" <i>filiformis</i> .....
114.	" .....	" <i>filiformis</i> var. <i>latifolia</i> .....
115.	" .....	" <i>trichocarpa</i> .....
116.	" .....	" <i>stricta</i> .....
117.	" .....	" " var. <i>decora</i> .....
118.	" .....	" <i>grisea</i> .....
119.	" .....	" <i>laxiflora</i> .....
120.	" .....	" <i>Richardsoni</i> .....
121.	" .....	" <i>pubescens</i> .....
122.	" .....	" <i>alopecoida</i> .....
123.	" .....	" <i>gravida</i> .....
124.	" .....	" <i>vulpinoidea</i> .....
125.	" .....	" <i>rosea</i> .....
126.	" .....	" <i>sparganioides</i> .....
127.	" .....	" <i>siccata</i> .....
128.	" .....	" <i>tribuloides</i> .....
129.	" .....	" " var. <i>reducta</i> .....
130.	" .....	" <i>scoparia</i> .....
131.	" .....	" <i>foenea</i> .....
132.	" .....	" " var. <i>perplexa</i> .....

Sedge Family: *Cyperaceæ*—Concluded.

	Common Name.	Botanical Name.
133.	Sedge .....	<i>Carex straminea</i> .....
134.	" .....	" " var. <i>brevior</i> .....

Rush Family: *Juncaceæ*.

135.	Sedge .....	<i>Juncus Balticus</i> .....
136.	" .....	" <i>setaceus</i> .....
137.	" .....	" <i>tenuis</i> .....
138.	" .....	" <i>pelocarpus</i> .....
139.	" .....	" <i>acuminatus</i> .....
140.	" .....	" <i>nodosus</i> .....

## Miscellaneous Plants.

141.	Common Cat Tail .....	<i>Typha latifolia</i> .....
142.	Colorado Blue Grass .....	<i>Triticum glaucum</i> .....
143.	Wooly Beard Grass .....	<i>Erianthus brevibarbis</i> .....
144.	Golden Rod .....	<i>Solidago nemoralis</i> .....
145.	Red Clover .....	<i>Trifolium pratens</i> .....
146.	Tall Red Top, .....	<i>Tridonia cuprea</i> .....
147.	White Clover .....	<i>Trifolium repense</i> .....
148.	Alsike Clover .....	<i>Trifolium hybridum</i> .....
149.	Alfalfa Clover .....	<i>Medicago sativa</i> .....
150.	Crimson Clover .....	<i>Trifolium incarnatum</i> .....

## Medicinal Plants.

	Common Name.	Botanical Name.
1.	Borage .....	<i>Borrago officinalis</i> .....
2.	Boneset .....	<i>Eupatorium perfoliatum</i> .....
3.	Burdock .....	<i>Arcium Lappa</i> .....
4.	Heal-all .....	<i>Brunella vulgaris</i> .....
5.	Catnip .....	<i>Nepeta Cataria</i> .....
6.	Cockscomb .....	<i>Celosia cristata</i> .....
7.	Chamomile .....	<i>Anthemis nobilis</i> .....
8.	Castor Oil Bean .....	<i>Ricinus communis</i> .....
9.	Elderberry, Blossom .....	<i>Sambucus Canadensis</i> .....
10.	Elderberry .....	" " .....
11.	Jamestown Weed .....	<i>Datura Stramonium</i> .....
12.	Hoarhound .....	<i>Marrubium vulgare</i> .....
13.	Horse-mint .....	<i>Monarda punctata</i> .....
14.	Common Hop .....	<i>Humulus Lupulus</i> .....
15.	Pokeberry .....	<i>Phytolacca decandra</i> .....
16.	Ground Ivy .....	<i>Nepeta Glechoma</i> ..

*Medicinal Plants—Concluded.*

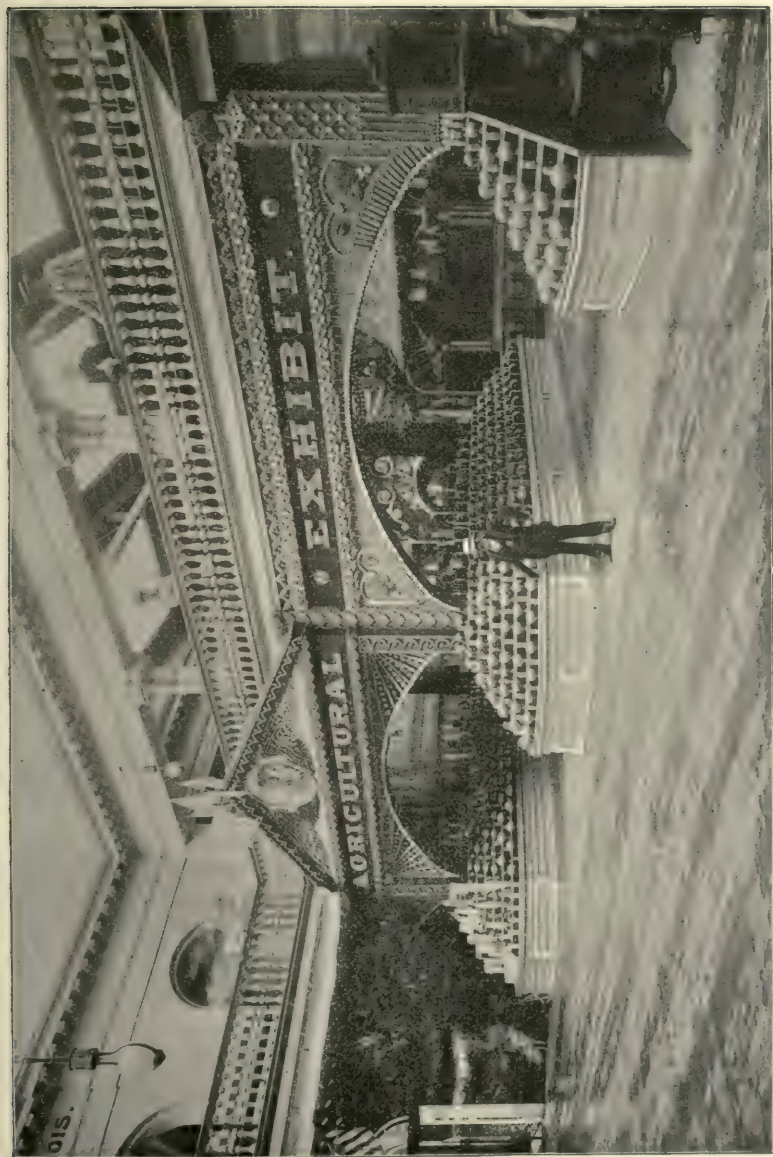
<i>Common Name.</i>	<i>Botanical Name.</i>
17. Indian Balsam, Cudweed.....	Gnaphalium .....
18. Indian Turnip.....	Arisæma triphyllum.....
19. Red Lobelia, Cardinal Flower .....	Lobelia cardinalis .....
20. Mustard.....	Brassica.....
21. Molucca Balm .....	Moluccella læris (Cult.).....
22. Milkweed .....	Asclepias .....
23. Mullein .....	Verbascum Thapsus.....
24. Motherwort .....	Leonurus Cardiaca.....
25. Pennyroyal.....	Hedeoma pulegioides.....
26. Peppermint .....	Mentha piperita.....
27. Poppy.....	Papaver somniferum .....
28. Meadow Sweet.....	Spiræa .....
29. Scouring Rush .....	Equisetum hyemale.....
30. Sage.....	Salvia officinalis (Cult.).....
31. Smartweed.....	Polygonum Hydropiper.....
32. Sweet Basil.....	Ocimum basilicum.....
33. Stinging Nettle.....	Urtica dioica.....
34. Snakeroot.....	Liatris spicata .....
35. Staghorn Sumach.....	Rhus typhina.....
36. Plantain .....	Plantago major.....
37. Tansy .....	Tanacetum vulgare.....
38. Witch Hazel.....	Hamamelis Virginica.....
39. Wormwood.....	Artemisia Absinthium .....
40. Willow (Root).....	Salix.....
41. Yellow Dock.....	Rumex crispus .....
42. Yarrow.....	Achillea Millefolium.....
43. Summer Savory .....	Satureia hortensis (Cult.) .....
44. Sheep Sorrel .....	Oxalis corniculata var. Stricta.....
45. Strawberry.....	Fragaria Virginiana.....
46. Parsley.....	Carve petroselinum .....
47. Coriander .....	Coriandrum sativum.....
48. St. John's Wort.....	Hypericum perforatum .....
49. Blessed Thistle.....	Cnicus syngenesia .....
50. Sassafras.....	Sassafras officinale.....
51. Dandelion.....	Taraxicum officinale.....
52. Raspberry.....	Rubus.....
53. Ragweed.....	Ambrosia.....
54. Marigold (Calendula).....	Ambrosia officinalis.....
55. Balm .....	Monarda .....
56. Ramie.....	Bœhmeria nivea.....
57. Fennel.....	Anthemis cotula.....
58. Wild parsnip.....	Pastinaca sativa.....

## Wheat.

- |                        |                           |
|------------------------|---------------------------|
| 1. Gold Dust.          | 34. Jones' Winter Fife.   |
| 2. Early Ripe.         | 35. Hybrid Clauson.       |
| 3. Velvet Chaff.       | 36. Oregon Swamp.         |
| 4. Democrat.           | 37. Red Turkish.          |
| 5. Red Fultz.          | 38. Saskatchewan.         |
| 6. Improved Fultz.     | 39. Rio Grande.           |
| 7. Swamp.              | 40. Hundred Fold.         |
| 8. Martin's Amber.     | 41. Prince of Wales.      |
| 9. Hickman.            | 42. Holborn Wonder.       |
| 10. Walker.            | 43. Carter's Queen.       |
| 11. May.               | 44. Earliest of All.      |
| 12. Mediterranean.     | 45. U. S. Spring.         |
| 13. Herman Amber.      | 46. Stand Up.             |
| 14. Michigan Amber.    | 47. Stand Up (as Spring). |
| 15. Turkey.            | 48. Miller's Delight.     |
| 16. Poole.             | 49. Miller's Delight,     |
| 17. White Cap.         | (Spring.)                 |
| 18. Currilli Prolific. | 50. Pride of the Market.  |
| 19. Sheriff.           | 51. Pride of the Market,  |
| 20. Hicks.             | (Spring.)                 |
| 21. Witter.            | 52. Anglo Canadian.       |
| 22. Miller's Prolific. | 53. Anglo Canadian,       |
| 23. Wisconsin Triumph. | (Spring.)                 |
| 24. Wyandotte Red.     | 54. Bird Proof.           |
| 25. Ohio Early Ripe.   | 55. Cross Bred Salvador.  |
| 26. New Longberry Wa-  | 56. Red Wonder.           |
| bash.                  | 57. Reliable.             |
| 27. Fairfield.         | 58. Golden Velvet White.  |
| 28. Miami Valley.      | 59. Golden Velvet Red.    |
| 29. Nigger.            | 60. Odessa.               |
| 30. Finley.            | 61. Mammoth Chili.        |
| 31. Longberry.         | 62. Minnesota Spring.     |
| 32. New Monarch.       | 63. Hunter's Winter       |
| 33. German Emperor.    | White.                    |

*Wheat*—Continued.

- |                          |                             |
|--------------------------|-----------------------------|
| 64. Empress of India.    | 96. Red Clauson.            |
| 65. Ruff. Chaff Chaddam. | 97. Adams' Prolific.        |
| Winter.                  | 98. Rocky Mountain          |
| 66. Bromick Red Winter.  | Winter.                     |
| 67. Square Head Red.     | 99. Alabama May.            |
| 68. Mealy.               | 100. Canadian Winter.       |
| 69. Crate.               | 101. Champion White Win-    |
| 70. Improved Rice.       | ter.                        |
| 71. Extra Early Oakly.   | 102. Kissingland Red Win-   |
| 72. Oregon.              | ter.                        |
| 73. Big English.         | 103. Cone's or Rivett's Red |
| 74. Bearded Monarch.     | Winter.                     |
| 75. McGhus White.        | 104. Kimer Red Winter.      |
| 76. Hybrid Mediterran-   | 105. Velvet Chaff Ruff      |
| ean.                     | Winter.                     |
| 77. Red Prussian.        | 106. Imperial White Winter. |
| 78. Ontario Wonder.      | 107. Defiance Red Winter.   |
| 79. Martin's Amber.      | 108. Bremen Winter.         |
| 80. Lehigh.              | 109. Royal Prize Red Win-   |
| 81. Golden Cross.        | ter.                        |
| 82. Theiss.              | 110. White Swan Winter.     |
| 83. Deitz Longberry Red. | 111. Mainstay White Win-    |
| 84. Golden Prolific.     | ter.                        |
| 85. Lebanon.             | 112. Hungarian White.       |
| 86. Tasmanian Red.       | 113. King of Wheat, White   |
| 87. Tuscan Island.       | Bearded.                    |
| 88. Fulcaster.           | 114. Hallit's Red Winter.   |
| 89. Deitz.               | 115. Spalding Red Winter.   |
| 90. Hindoostan.          | 116. French Imperial        |
| 91. Diehl Mediterranean. | Spring.                     |
| 92. Walker's Winter.     | 117. Okanagan Valley Vel-   |
| 93. Rudy.                | vet Chaff.                  |
| 94. White Russian.       | 118. Red River Valley       |
| 95. Red Sea.             | Spring.                     |



AGRICULTURAL EXHIBIT.

CHAPTER IV

*Wheat—Concluded.*

- |                                  |                                     |
|----------------------------------|-------------------------------------|
| 119. Golden Drop Spring.         | 137. Indian White Winter.           |
| 120. Senegambia Spring.          | 138. Improved Mediterranean Winter. |
| 121. Assinaboin Spring.          |                                     |
| 122. Saskatchewan Spring.        | 139. Bhima Varta Winter.            |
| 123. Denmark Royal 1.            | 140. Rochester Red Winter.          |
| 124. Ladoga Spring.              | 141. Japan Amber Winter.            |
| 125. Triumph Winter.             | 142. Odessa Club Spring.            |
| 126. Calcutta Royal Club Winter. | 143. Early Red Russian Winter       |
| 127. Canadian Red Fife Spring.   | 144. Australian Spring.             |
|                                  | 145. Silver Chaff Red Winter.       |
| 128. Hedgerow Spring.            |                                     |
| 129. Limbo Winter.               | 146. Champion White Winter.         |
| 130. American Bronze Winter.     | 147. Never Fail Winter.             |
| 131. Black Sea Winter.           | 148. Tasmanian Winter.              |
| 132. Blue Stem Spring.           | 149. Champion Winter.               |
| 133. Hindoostan Winter.          | 150. Red Turkey Winter.             |
| 134. Ontario Red Winter.         | 151. Red River Club Spring.         |
| 135. Manistee Winter.            | 152. Argentine Winter.              |
| 136. Red Chaff Winter.           |                                     |

**Oats.**

- |                         |                       |
|-------------------------|-----------------------|
| 1. Pringle's Progress.  | 12. Canada White.     |
| 2. White Wonder.        | 13. Early Dakota.     |
| 3. Second Premium.      | 14. White Victoria.   |
| 4. White Swede.         | 15. Hopetown.         |
| 5. Early Lackawanna.    | 16. White Belgian.    |
| 6. White Bonanza.       | 17. Prize Cluster.    |
| 7. Calgarry Gray.       | 18. Hargett's White.  |
| 8. Welcome.             | 19. Centennial.       |
| 9. Badger Queen.        | 20. Swedish.          |
| 10. Clydesdale.         | 21. Egyptian.         |
| 11. Bickett's Colombia. | 22. Texas Rust Proof. |

*Oats—Concluded.*

- |                          |                           |
|--------------------------|---------------------------|
| 23. American Banner.     | 52. Early Archangel.      |
| 24. Baltic White.        | 53. Surprise.             |
| 25. Japan.               | 54. Royal Victoria.       |
| 26. New Dakota Grey.     | 55. Victoria.             |
| 27. White Schonen.       | 56. Black Scotsman.       |
| 28. Probestier.          | 57. Peerless.             |
| 29. American Triumph.    | 58. Norway.               |
| 30. Wide Awake.          | 59. Golden Cluster,       |
| 31. Prolific Side.       | 60. Barley Oat.           |
| 32. Improved American.   | 61. French Hybrid.        |
| 33. New Red Rust Proof.  | 62. Black Mexican.        |
| 34. Texas Red.           | 63. Early Ohio.           |
| 35. Race Horse.          | 64. Hermit.               |
| 36. Black Prolific.      | 65. Bohemian.             |
| 37. Black Tartarian.     | 66. White Siberian.       |
| 38. Black Russian.       | 67. Early Dakota North-   |
| 39. Imported White Rus-  | ern.                      |
| sian.                    | 68. Pringle's Progress.   |
| 40. Black Highlander.    | 69. Prize Winner.         |
| 41. Virginia Winter.     | 70. French Hybrid Side.   |
| 42. Canadian Black.      | 71. Black Highland.       |
| 43. White Russian.       | 72. New Flying Scotchman. |
| 44. Giant Yellow French. | 73. American Cross Black. |
| 45. Golden Giant Side.   | 74. Early Blossom.        |
| 46. Hungarian Hybrid.    | 75. Triumph White.        |
| 47. James Bickerdike.    | 76. English Winter White. |
| 48. Dakota Gray.         | 77. White Tartarian.      |
| 49. Pride of Grant Co.   | 78. Waterloo White.       |
| 50. Scottish Chief.      | 79. Tarry White.          |
| 51. Thousand Fold.       | 80. French Hybrid Queen.  |

**Barley.**

- |                      |                          |
|----------------------|--------------------------|
| 1. Royal Empress.    | 10. Peerless.            |
| 2. Six Rowed Winter. | 11. Golden Madeira.      |
| 3. Prolific.         | 12. White Hulless.       |
| 4. Spratt.           | 13. Beardless.           |
| 5. Black.            | 14. Manshury.            |
| 6. Four Rowed.       | 15. New Early Mentury.   |
| 7. Golden Drop.      | 16. Winter.              |
| 8. Black Hulless.    | 17. Short Ear Six Rowed. |
| 9. Goldtholpe.       | 18. Golden Mellow.       |

**Rye.**

- |                        |                     |
|------------------------|---------------------|
| 1. Excelsior Winter.   | 5. Prolific Winter. |
| 2. Giant Winter.       | 6. Black.           |
| 3. Saint Johns.        | 7. White.           |
| 4. Dakota Wonder White | 8. Spring, Common.  |
| Spring.                | 9. Winter, Common.  |

**Potatoes.**

- |                       |                        |
|-----------------------|------------------------|
| 1. Early Ohio.        | 17. Six Weeks.         |
| 2. Blue Dakota.       | 18. Green Mountain.    |
| 3. Burbank.           | 19. New Queen.         |
| 4. Early Rose.        | 20. Rural No. 2.       |
| 5. Snow Flake.        | 21. Mayflower.         |
| 6. Mammoth Pearl.     | 22. Beauty of Hebron.  |
| 7. Magnum Bonum.      | 23. Rose Seedling.     |
| 8. Peerless.          | 24. White Beauty.      |
| 9. Mammoth Prolific.  | 25. North Pole.        |
| 10. Rural New Yorker. | 26. Mills Prize.       |
| 11. Ohio Junior.      | 27. White Pearl.       |
| 12. Boston Market.    | 28. Polaris.           |
| 13. Empire State.     | 29. Early New Zealand. |
| 14. Pink Eye.         | 30. Brownell's Best.   |
| 15. Late Puritan.     | 31. The Vaughan.       |
| 16. Everett.          | 32. Seneca Beauty.     |

*Potatoes—Concluded.*

- |                        |                           |
|------------------------|---------------------------|
| 33. Mammoth Iron Clad. | 50. Gem of Salt Lake.     |
| 34. Early Market.      | 51. Late Rose.            |
| 35. Blue Peerless.     | 52. Green Mountain.       |
| 36. Early Wisconsin.   | 53. Irish Dude.           |
| 37. Mills Prize.       | 54. Dakota Red.           |
| 38. Chas. Downing.     | 55. Premium.              |
| 39. Big Elephant.      | 56. Koshkonong.           |
| 40. Mount Vernon.      | 57. Champion.             |
| 41. Dominie.           | 58. Blue Victor.          |
| 42. Lord Murray.       | 59. Northern Spy.         |
| 43. Chicago Market.    | 60. Alexander's Prolific. |
| 44. Utah King.         | 61. Arizona.              |
| 45. White Victor.      | 62. American Wonder.      |
| 46. Shaker Russet.     | 63. Signal.               |
| 47. Rose Seedling.     | 64. Crane's Juneeating.   |
| 48. Crown Jewel.       | 65. Empire State.         |
| 49. Shacton.           | 66. Perfection.           |

**Corn.**

- |                          |                          |
|--------------------------|--------------------------|
| 1. Leaming.              | 16. Tanley's.            |
| 2. White Rice.           | 17. Ruby.                |
| 3. Queen's Golden.       | 18. Monarch White Rice.  |
| 4. Evergreen.            | 19. Red Flint.           |
| 5. Crosby's Early.       | 20. Egyptian.            |
| 6. Quaker.               | 21. Mixed Rice.          |
| 7. Pfissler.             | 22. Early Rose.          |
| 8. Oreana.               | 23. Yellow Dent.         |
| 9. Clark's 100 Day.      | 24. 90 Day White.        |
| 10. Murdock.             | 25. Leeper.              |
| 11. Kellar's Early.      | 26. Early Missouri.      |
| 12. Bloody Butcher.      | 27. Blue River.          |
| 13. Indiana White.       | 28. North Star.          |
| 14. Illinois White Dent. | 29. Queen of the Field.  |
| 15. Mevris White.        | 30. Kentucky Horsetooth. |

*Corn—Continued.*

- |                                 |                                    |
|---------------------------------|------------------------------------|
| 31. White Flint.                | 61. Ohio White.                    |
| 32. Yellow Flint.               | 62. Forsyth's White.               |
| 33. Flour Corn.                 | 63. Early Taman.                   |
| 34. Pomeroy's.                  | 64. Hess.                          |
| 35. Iowa King White.            | 65. Strawberry.                    |
| 36. Mammoth Kentucky.           | 66. Mississippi Strawberry.        |
| 37. Early Mastodon.             | 67. Hickory King.                  |
| 38. Sidney.                     | 68. Reid.                          |
| 39. Improved Sidney.            | 69. Thomas.                        |
| 40. Forsythe White.             | 70. Kobell.                        |
| 41. Saint Charles.              | 71. Maddock.                       |
| 42. Eighty Day.                 | 72. Dawley.                        |
| 43. Golden Beauty Dent.         | 73. Early White.                   |
| 44. Primm's Dent.               | 74. Calico.                        |
| 45. Arlen's Yellow.             | 75. Blush.                         |
| 46. Helm's Improved<br>White.   | 76. White Monarch.                 |
| 47. VanDerhoof's Ivory<br>Dent. | 77. Early Minn.                    |
| 48. Miller's Best.              | 78. Red Rice.                      |
| 49. Bickbel's Pride Yellow.     | 79. Live Evergreen.                |
| 50. St. Clair Co.               | 80. Wilson's White Prolific.       |
| 51. Stewart's California.       | 81. Harrison Dent.                 |
| 52. Burlingame.                 | 82. Champion White.                |
| 53. North Star.                 | 83. Early Dakota Flint,<br>Yellow. |
| 54. King Philip.                | 84. Early Dakota Flint,<br>White.  |
| 55. Golden Beauty Dent.         | 85. Kentucky White Cap.            |
| 56. Wilson White Prolific.      | 86. Long John White.               |
| 57. Champion White<br>Pearl.    | 87. Riley's Favorite White.        |
| 58. Harrison.                   | 88. Crawford's Early<br>White.     |
| 59. Reading.                    | 89. Macedou.                       |
| 60. Sidney.                     |                                    |

*Corn—Concluded.*

- |                         |                     |
|-------------------------|---------------------|
| 90. Pride's Prolific.   | 95. Mammoth Red.    |
| 91. Riley's Early.      | 96. Early Red.      |
| 92. Pride of the North. | 97. Blue Corn.      |
| 93. Clark's.            | 98. Squaw.          |
| 94. Edmond's Favorite.  | 99. Arlen's Yellow. |

**Beans.**

- |                               |                          |
|-------------------------------|--------------------------|
| 1. Navy.                      | 18. Castor Oil Bean.     |
| 2. Butter.                    | 19. Lucus.               |
| 3. Black Wax.                 | 20. White Field.         |
| 4. White Pea.                 | 21. California Wax.      |
| 5. Early Valentine.           | 22. String Bean.         |
| 6. German Wax Pole.           | 23. Yankee.              |
| 7. Large Lima.                | 24. San Domingo.         |
| 8. Red Lima.                  | 25. Prolific.            |
| 9. Black Lima.                | 26. 1000 to 1.           |
| 10. Burpee's Bush Lima.       | 27. White Tree.          |
| 11. Black Bunch.              | 28. Catalpa.             |
| 12. Yellow Bunch.             | 29. White Marrow.        |
| 13. Green Six Weeks.          | 30. Refugee.             |
| 14. Henderson's Bush<br>Lima. | 31. White Kidney.        |
| 15. Washington Lima.          | 32. Sickle.              |
| 16. Golden Cluster Wax.       | 33. Early Yellow Kidney. |
| 17. Giant Lima.               | 34. Pisum.               |
|                               | 35. Japanese.            |

**Grass Seeds.**

- |                   |                     |
|-------------------|---------------------|
| 1. Kentucky Blue. | 7. Creeping Bent.   |
| 2. Perennial Rye. | 8. Tall Meadow Oat. |
| 3. Yellow Oat.    | 9. Cockfoot.        |
| 4. Timothy.       | 10. Red Top.        |
| 5. Orchard.       | 11. Lawn.           |
| 6. English Blue.  |                     |

**Clover.**

- |                |                 |
|----------------|-----------------|
| 1. Crimson.    | 4. Mammoth Red. |
| 2. White.      | 5. Alsike.      |
| 3. Medium Red. | 6. Sweet.       |

**Millet.**

- |                   |               |
|-------------------|---------------|
| 1. German.        | 3. Common.    |
| 2. Golden Wonder. | 4. Hungarian. |

**Buckwheat.**

- |           |                   |
|-----------|-------------------|
| 1. Black. | 3. Silver Hull.   |
| 2. Gray.  | 4. Japanese Hull. |

**Pop Corn.**

- |                           |                         |
|---------------------------|-------------------------|
| 1. White Rice.            | 11. Blue.               |
| 2. Yellow Rice.           | 12. Hybrid.             |
| 3. Red Rice.              | 13. Premium Pearl.      |
| 4. Speckled Rice.         | 14. Monarch White Rice. |
| 5. Wee Bit.               | 15. Mapledale Prolific. |
| 6. Rat Tail.              | 16. Silver Lace.        |
| 7. Wisconsin Eight Rowed. | 17. Golden Tom Thumb.   |
| 8. California Yellow.     | 18. New Australian.     |
| 9. White Pearl.           | 19. Red Husk.           |
| 10. Queen's Golden.       | 20. Child's Favorite.   |

**Sweet Corn.**

- |                         |                  |
|-------------------------|------------------|
| 1. Minnesota.           | 6. Late Mammoth. |
| 2. Stowell's Evergreen. | 7. Red Sugar.    |
| 3. Corys.               | 8. Perry Hybrid. |
| 4. Black Mexican.       | 9. Shoe Peg.     |
| 5. Old Colony.          |                  |

**Peas.**

- |                         |                        |
|-------------------------|------------------------|
| 1. Gladiator.           | 7. White Marrow Fat.   |
| 2. Chelsea.             | 8. Early Philadelphia. |
| 3. Evolution.           | 9. Early Kent.         |
| 4. Champion of England. | 10. American Wonder.   |
| 5. McLean's Little Gem. | 11. Stratagem.         |
| 6. Alaska.              |                        |

**Nuts.**

- |                         |                        |
|-------------------------|------------------------|
| 1. Chestnut.            | 7. Butternuts.         |
| 2. Horse Chestnut.      | 8. Large Black Walnut. |
| 3. Walnut.              | 9. Chinquapins.        |
| 4. Peanut.              | 10. Hazel Nuts.        |
| 5. Acorns—11 varieties. | 11. Hickory Nuts.      |
| 6. Pecans.              |                        |

**Vegetables.**

- |                      |                       |
|----------------------|-----------------------|
| 1. Kohl Rabi, White. | 2. Kohl Rabi, Purple. |
|----------------------|-----------------------|

**Cabbage.**

- |                        |                  |
|------------------------|------------------|
| 1. Winnistadt.         | 6. Bul Rock.     |
| 2. Flat Dutch.         | 7. Red Pickling. |
| 3. Drumhead.           | 8. Savoy.        |
| 4. Marblehead Mammoth. | 9. Sure Head.    |
| 5. World Beater.       |                  |

**Miscellaneous.**

Persimmons.

**Amount of Grains in Sack on Hand in Spring of 1893,  
and Used in Installing Exhibit. 1 Peck Per Sack.**

Wheat.....	196 sacks.
Oats.....	198 "
Barley.....	41 "
Rye.....	37 "
Flax.....	9 "
Buckwheat.....	17 "
Sorghum.....	4 "
Broom Corn.....	12 "
Clover.....	11 "
Millet.....	7 "
Grass seed.....	25 "

**Vegetable Seeds.**

Peas.....	19 "
Beans.....	39 "
Miscellaneous.....	29 "

**Corn.**

White Dent.....	75 Bush.
Yellow Dent.....	150 "
Red Dent.....	20 "
Fancy.....	25 "
Mixed.....	40 "
Pop Corn.....	95 "

**Bundles of Grain and Grass Used in Making and Installing the Agricultural Exhibit. Gathered in 1892.**

Wheat.....	871 Bundles.
Oats.....	2,191 "
Rye.....	328 "
Clover.....	46 "
Barley.....	75 "
Timothy.....	1,406 "
Wild grasses.....	595 "
Millet.....	460 "

*Bundles of Grain and Grass Used—Concluded.*

Cotton.....	6
Castor Beans .....	6
Flax.....	9
Hemp .....	20
Corn in stalk .....	75
Corn tassels.....	200
Tobacco .....	10

Respectfully submitted,

D. W. VITUM, Chairman;

JAMES S. WASHBURN,

E. E. CHESTER,

B. F. WYMAN,

W. H. FULKERSON,

*Committee.*

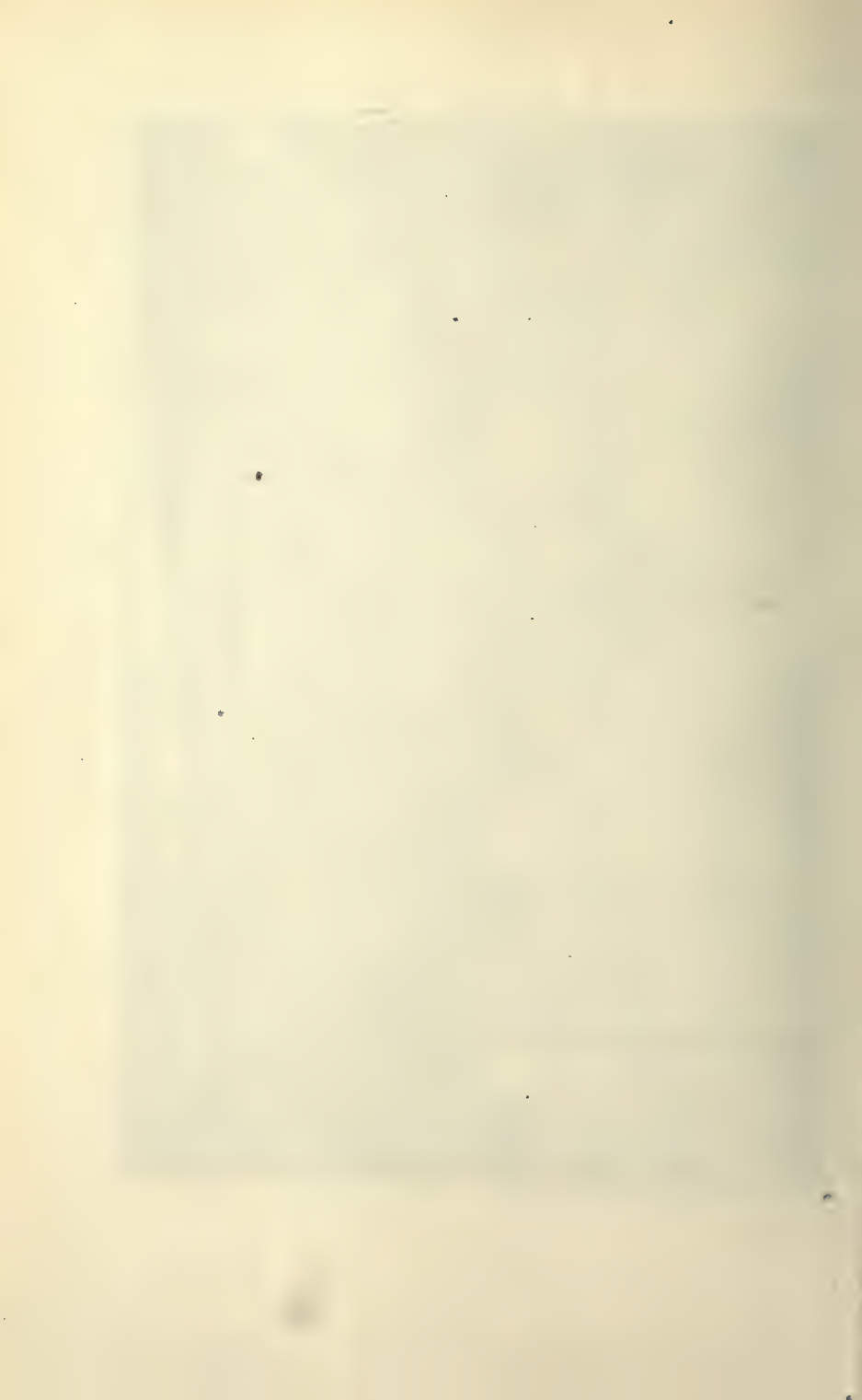
W. A. YOUNG,

J. W. RICHART,

*In Charge of Display in Agricultural Building.*



HORTICULTURAL EXHIBIT.



## REPORT OF COMMITTEE ON HORTICULTURE AND FLORICULTURE.

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**T**HE Committee on Horticulture and Floriculture, appointed to carry out the requirements of Section II of the organic law creating this Commission, so far as the same refers to "horticulture and floriculture," begs leave to report:

The Horticultural Section in the Illinois State Building occupied a large area at the southwest end of the main exposition hall. The display was arranged upon suitably designed tables and shelves. The products exposed included samples of all fruits cultivated in the State of Illinois. "That a full and complete collection of all the cultivated products in Horticulture and Floriculture, in illustration of the widely different conditions of soil and climate under which rural husbandry is practiced in the various sections of the State of Illinois," might be shown, your Committee caused to be placed in cold storage two hundred and sixteen bushels of apples, the fruit of Illinois of 1892, with which they commenced the exhibition in May, 1893, and replenished the tables from time to time as needed. The result of the cold storage was very satisfactory. The Jonathan and similar kinds of apples, taken from the cold storage May 15 and constantly exposed upon open tables, remained sound until July 28, while the Ben Davis kept until the latter part of September.

Notwithstanding the fact that the spring was very late, and late frosts prevailed in the southern portions of the State, we were enabled to show strawberries from May 10 to July 30; gooseberries from May 26 to August

18; raspberries from June 1 to August 9; cherries from May 28 to August 16; currants from June 1 to August 12; blackberries from June 16 to August 10; plums from June 24 to October 25; grapes from July 4 to October 30; apricots from July 12 to August 20; persimmons from September 12 to October 30; mulberries, May apples, papaws, pecans, chestnuts, etc., at various times. Apples of 1893 were received from June 12 to the close of exhibition; peaches from June 10 to October 30; pears from June 24 to October 30.

In order to show the climatic conditions, all of the above fruits of 1893 were shown without cold storage or preservation of any kind. The Committee commenced at the extreme southern portion of the State, with the fruits which ripened earliest, and progressed from south to north, as the different varieties of fruit came into season, thus demonstrating the length of the fruit season in Illinois.

This exhibit of the fruits of 1893 was repeatedly asserted by visitors to be the largest and most complete of any on the ground, where the fruit was in its natural state, entirely devoid of cold storage, preservatives or bottling.

Exclamations of surprise were numerous, both from our own people and those from other states, "that so extensive and complete a collection could be made in a year of such general failure of fruits." When we consider that the crop of apples was probably less than five per cent. of an average yield and that all other fruits were very light, it fully demonstrates that the present capabilities of our State are wonderful. The three grand divisions of the State have their representative varieties, naturally adapted to each; the northern division growing the more hardy and giving a finer flavor to most of them; while the central adds many

new varieties that cannot be grown north, but here produce abundantly. Still the great southern district must be said to be the home of horticulture, where all but the semi-tropical fruits can be grown in abundance. The people are already realizing this fact, and from the new impetus here given will plant trees by the million, embracing all of the best old and new varieties.

It is safe to predict that the present decade will show greater advancement in growing, preserving and marketing fruits than for one hundred and fifty years previous, during which fruit has been growing in some parts of this State.

Though nurseries were not included in our exhibition, yet as manhood is the outgrowth of childhood, so the nurseries are the source from which the fruit growers drew to build up the industry of horticulture in all its various branches.

The horticulturists of Illinois have an almost unlimited supply from which to fill their orchards with plants, trees, vines and shrubs, as there are in our own State four hundred and thirty-four nurseries, of which number one hundred and thirty-eight have been established in the last few years. There have been millions of apple trees planted in orchards every year, while the various other fruits have kept pace with the apple.

#### LIST OF FRUITS EXHIBITED.

##### Apples—95 Varieties.

Red June.	Buckingham.
Saps of Wine.	Utter's Red.
Red Astrachan.	Chicken Apple.
Kirkbridge White.	Purple Striped.
Golden Sweet.	Ben Davis.
Fameuse.	Gilpin.
Benoni.	Michael Henry Pippin.

*Apples*—Continued.

Rawles' Janet.	Maiden's Blush.
Bailey's Sweet.	Wealthy.
Jonathan.	Porter.
Lady's Sweet.	Coe's Spice.
Stark.	Rambo.
Garfield.	May of Myers.
Lansinburg.	Rome Beauty.
Nickajack.	White Winter Pearmain.
Willow Twig.	Winesap.
Sweet June.	Tulpehocking.
Summer Sweet.	Hubbardston Nonsuch.
Sweet Bough.	Spitzenberg.
Fall Wine.	Tyrell's Late.
Mother.	Rhode Island Greening.
Alexander.	Tolman Sweet.
S. S. Pippin.	Nelson's Sweet.
Lowell.	Grimes' Golden.
Holmon.	Plum's Cider.
Chronicle.	Baldwin.
Yellow Bellflower.	Limber Twig.
Aken's Seedling.	Northern Spy.
Pryor's Red.	Striped Pippin.
Black Gilliflower.	Park's Late.
Vandervere Pippin.	Lawyer.
Winter Red.	Cache.
Wolf River.	Pennock.
Shockley.	Detroit Black.
Ortley.	Smith's Cider.
Gana.	Fink.
Tewksbury Winter.	Roxbury Russet.
Walbridge.	Haas.
Early Harvest.	Red Canada.
Yellow Transparent.	Cullasaga.
Duchess of Oldenburg.	Neil's Keeper.

*Apples*—Concluded.

Black Vernon.	Roman Stem.
Bricelands.	White Pippin.
Milam.	Egyptian Queen.
English Golden Russet.	Anidigo.
Minkler.	King of Tompkins County.
Huntsman's Favorite.	Domine.

**Crab Apples—7 Varieties.**

Sanborn.	White Arctic.
Large Siberian.	Hyslop.
Whitney's No. 20.	North Western.
General Grant.	

**Pears—31 Varieties.**

Richardson.	Beurre d'Anjou.
Mt. Vernon.	Sheldon.
Seckel.	Tyson.
Johonnot.	Mercel.
Clapp's Favorite.	Bloodgood.
Flemish Beauty.	Early Harvest.
Doyenne d'Ete.	Doyenne Boussock.
Garber.	White Doyenne.
Buffum.	Duchess d'Angouleme.
Keifer.	Bartlett.
Belle Lucrative.	Louise Bonne de Jersey.
Buerre Clarigan.	Howell.
Koonze.	LeConte.
Osband's Summer.	Buerre Bosc.
Beurre Deil.	Vicar of Wakefield.
Onondaga.	

**Peaches—42 Varieties.**

Amsden.	Hale's Early.
Reeve's Favorite.	George the Fourth.
Mary Ann.	Thurber.
Silver Medal.	Steven's Rareripe.
Beatrice.	Crawford's Early.
Salaway.	Chinese Cling.
Waterloo.	Old Mixon Free.
Lufkin's Golden.	Alexander.
Troth's Early.	Stump the World.
Western Beauty.	Shonsaker.
Elberta.	Red Bud.
Morris White.	Early Ripe.
Crawford's Late.	Heath Free.
Park's Cling.	Early York.
Old Mixon Cling.	Smock.
Early May.	Wheatland.
Summer Rose.	White Excelsior.
Anderson.	Mountain Rose.
Bequet's Late.	October Cling.
Garland.	Capt. Ede.
Heath Cling.	Hayworth.

**Plums—25 Varieties.**

American Beauty.	Fox Seedling.
Marianna.	Mormon.
Wild Goose.	Weaver.
Miner.	Bradshaw.
Arkansas Lombard.	Forest Garden.
Lombard.	Golden Beauty.
Duane's Purple.	Green Gage.
Pottawattamie.	Chickasaw.

*Plums*—Concluded.

Wayland.	Hudson River Egg.
Robinson.	Henry.
Abundance.	Coe's Golden Drop.
Poole's Seedling.	Damson.
Washington.	

**Currants—9 Varieties.**

Fay's Prolific.	White Grape.
Cherry.	Victoria.
Versailles.	Black English.
White Dutch.	Pochrasky's Seedling.
Red Dutch.	

**Gooseberries—5 Varieties.**

Mountain Seedling.	Downing.
Industry.	Smith's Improved.
Houghton.	

**Grapes—72 Varieties.**

Cottage.	Norwood.
Lindley.	Venango.
Woodruff Red.	Green's Golden.
Lady Washington.	Salem.
Hartford.	Brant.
Post Oak.	Brighton.
Prentiss.	Catawba.
Erowa.	Niagara.
Delaware.	Packlington.
Wilder.	Brilliant.
Elvira.	Moore's Diamond.
Barry.	Moore's Early.
Prairie State.	Etta.
Clinton.	Eldorado.
F. B. Hayes.	Goethe.

*Grapes—Concluded.*

Backus.	Albert.
Mason's Seedling.	Wyoming Red.
Early Victor.	Arrianna.
Muscatine.	Marguinte.
Arminia.	Diana.
Agawam.	Rogers' No. 8.
Challenge.	Jessica.
Missouri Seedling.	Isabella.
Triumph.	Beauty.
Conqueror.	Alfonso.
Jewell.	Porter's Seedling.
Massasoit.	Norton's Virginia.
Martha.	Guttenburg.
Iron Clad.	Seedling No. 3.
Champion.	Concord.
Perkins.	Uhland.
Jefferson.	Mayer.
Eumelan.	Gold Cain.
Iona.	Arkansas.
Herbert.	Ives' Seedling.
Noah.	Anistia.

**Cherries—7 Varieties.**

Yellow Napoleon.	English Ox Heart.
May Duke.	English Morello.
Early Richmond.	Black Morello.
Early May.	

**Quinces—4 Varieties.**

Orange Quince.	Champion.
Merch's Prolific.	Ray's Monmouth.

**Persimmons—3 Varieties.**

Golden Beauty.	Native Late.
Native Early.	

**Mulberries—3 Varieties.**

Russian.	Downer's Everbearing.
White.	

**Strawberries—22 Varieties.**

Crescent.	Bubach's No. 5.
Gaudy.	Gertrude.
Sharpless.	Charles Downing.
Red Jacket.	Itasca.
Miner.	Warfield.
Plow City.	Manchester.
Capt. Jack.	Sucker State.
Belmont.	Princeton Chief.
Early May.	Wilson's Albany.
Michael's Early.	Logan.
Cumberland Triumph.	Haviland.

**Raspberries—10 Varieties.**

Doolittle.	Cuthbert.
Ohio.	Brandywine.
Philadelphia.	Souhegan.
Turner.	Gregg.
Monmouth Cluster.	Shaffer's Colossal.

**Blackberries—11 Varieties.**

Snyder.	Erie.
Ancient Britton.	Stone's Hardy.
Lawton.	Early Harvest.
Early King.	Wilson Junior.
Kittatinny.	White.
Nevada.	

**Miscellaneous.**

May Apples.	Pecans.
Papaws.	Chestnuts.
Apricots—3 Varieties.	

## FLORICULTURE.

The floricultural exhibit was also displayed mainly in the southwest portion of the Illinois State Building, and was arranged upon suitably disposed tables, shelves, brackets, and in hanging baskets.

First: It consisted of specimens of the indigenous flora of Illinois, gathered from the various sections of the State, as far as possible.

Of the flora indigenous to Illinois—the wild flowers—the display was creditable, while not fully up to the hopes and wishes of the Committee in charge and others interested.

Illinois, climatically considered, is a great State; its Northern division producing, in floriculture, as in agriculture and horticulture, the best, the most beautiful of the northern products; the central division, those of the temperate zone in their fullest and most perfect beauty, while the southern district borders upon the most luxuriant of the semi-tropical regions. Of what was exhibited and is indigenous to our State, we cannot enter into detail. We have many striking ferns. We might say that our flora partakes largely of the western type, but that is not all. We have many varieties heretofore thought to belong to the Eastern, Southern and extreme Western States, and even to sections as far south, or farther, than Mexico and the Gulf. The *Hepatica* (Liverwort) is common to the East, West and South. The *Violaceæ* (Violet) and the *Dicentra* (Dutchman's Breeches) are almost universal in their growth and modest beauty. The *Ranunculaceæ* (Crowfoot) and *Phlox* are common to our prairies, as are the *Aquilegia* (Columbine) and the *Delphinium* (Larkspur). The *Lily* in its many species, also *Ladies' Tresses*, *Ladies' Finger*, *Golden Rod* and a practically endless variety of beauti-

ful native flowers adorn our prairies, woodlands and water-ways. Of these, such as were suitable and seasonable were shown.

The reader of this report may miss one or more of his favorite flowers, but it must be remembered that a tabulated list of all the flora of our great State, wild and uncultivated, would require months to prepare, and would occupy more space when published than this Committee is allowed for the entire report. We can only touch upon the matter in a seemingly cursory manner, and yet we desire to do full justice to all interests. This of floriculture is so large, so general in its features and so peculiar in its make-up, as to the use of proper terms and the bringing out of prominent features, as to require in the estimation of many, the services of an expert in that special line, whose report when made, while perfectly intelligible to those particularly interested or engaged in the growth and propagation of flowers, would, with its multifarious and constantly repeated Latin names and phrases, be as unintelligible to the general public as a dissertation published in the Greek language.

The floricultural display in the Illinois Building spoke for itself. While not perfect, it was eminently satisfactory to the thousands of visitors of our State, and fairly so to the Committee in charge. It surpassed any other state exhibit of the kind on the grounds.

Second: The cultivated plants and shrubs contributed were properly staked and labelled. Cut flowers were shown in vases and in designs, together with potted plants, and displayed in large quantities throughout the season. Among these over fifty varieties of the so-called

ever-blooming cannas made a fine continuous show, with their variety of colors. It was a difficult matter to keep plants in bloom in the hall, since most flowers will not hold their bloom long in pots, in-doors, and cut flowers will last but a few days. Hydrangeas stood better than all other flowering plants, of which there were many hundred varieties.

The hanging baskets inside of the Building, of which there were more than one hundred, had to be often re-filled. Of the plants in these vinca and cyperus stood best. For decorative purposes the philodendrons and palms lasted longer than any others. One or two wagon loads of potted plants were furnished daily during the entire time of the exhibit.

For the fountain and aquarium there were supplied water hyacinth, cyperus, calla Ethiopica, alocasia and caladiums, and potted shrubs, deutzia, aralia, rhododendrons, spireas and roses. Of hardy herbaceous plants, phlox, clianthus and delphinium made the best exhibit of flowers. Of hardy shrubs, hydrangea paniculata, weigelia rosea, syringa, lilac and tartarian honeysuckle were prominent. Of annuals there were asters, sweet peas, dianthus and others of the better known sorts. Bulbs and roots were not forgotten, including cannas and tulips. Untrained gladioli, hyacinths and other spring and summer bulbs were freely used.

Mr. John C. Ure, florist, who was employed by the Committee as Superintendent of this Department, is entitled to much credit for the satisfactory way in which he discharged his duties.

The Committee feel that they may congratulate themselves upon the economy exercised throughout all the departments, in making the unrivalled exhibition for

our State. With an appropriation of \$20,000 at their command, not to exceed one-half was expended, and yet they feel that not one dollar was saved at the expense of a full and thorough exhibit in our departments.

Respectfully submitted,

E. B. DAVID,

J. K. DICKIRSON,

B. PULLEN,

W. D. STRYKER,

S. W. JOHNS,

*Committee.*

## REPORT OF COMMITTEE ON EDUCATIONAL EXHIBIT.

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**T**HE Committee on Educational Exhibit begs leave to report:

The general approval and commendation of the Educational Exhibit by the people of this State, as manifested by the public and educational press as well as individually by competent judges, is a matter of just congratulation to the Committee and this Board.

In organizing the Educational Department it was decided to classify the exhibit into five sections, viz.:

1. The Model Public School Room (fully equipped).
2. The Public Free School.
3. The Southern Illinois Normal University.
4. The Illinois Normal University.
5. The University of Illinois.

The Model Public School Room was arranged and its furniture, apparatus, etc., were selected under the direction of Hon. Henry Raab, Superintendent of Public Instruction.

The exhibit of the Public Free Schools was planned and installed by William Jenkins, Superintendent of Schools, Mendota, Illinois.

The work of the Southern Normal University was devised and installed under the direction of John Hull, then President of the School.

The exhibit of the Illinois Normal University was planned and installed by the faculty, under the supervision of Dr. John W. Cook, the President of the Institution.

The exhibit of the University of Illinois was planned and installed under the supervision of a committee of the faculty, Prof. George E. Morrow, Chairman.

The broad conception, accurate knowledge and unwearied zeal which characterized the labors of these men need neither commendation nor mention here; they have already become a part of the noble history of the State.

The reports of the directors and superintendents of the several sections of this Department, giving in detail the plans and aims of these several exhibits, have been submitted to your Committee, and having been carefully collated and considered are hereby made the report of this Committee.

Respectfully submitted,

E. E. CHESTER,

J. M. WASHBURN,

J. K. DICKIRSON,

S. W. JOHNS.

*Committee.*

## MODEL SCHOOL ROOM.

---

HENRY RAAB, SUPERINTENDENT PUBLIC INSTRUCTION.

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**I**N pursuance of the act to provide for the participation of the State of Illinois in the World's Columbian Exposition, approved June 17, 1891, the Committee on Educational Exhibit decided to arrange for,

First, a Model School Room fully equipped with furniture, school appliances, maps, charts, physical and other apparatus, collections of animals and minerals as well as reference books and a library of supplementary reading for children. It was not the intention of the Committee to stock the room with everything that can be purchased for school use, but rather with such apparatus, appliances and instruments as are indispensable as a means of successful work in every school of the State. School officers were to learn by actual observation and comparison how much there is lacking in the equipment of their schools, how they are crippling their teachers by withholding from them these means. Some reference books and zoölogical and mineralogical specimens had to be purchased, and they are now on exhibition in this department for the inspection of teachers and school officers.

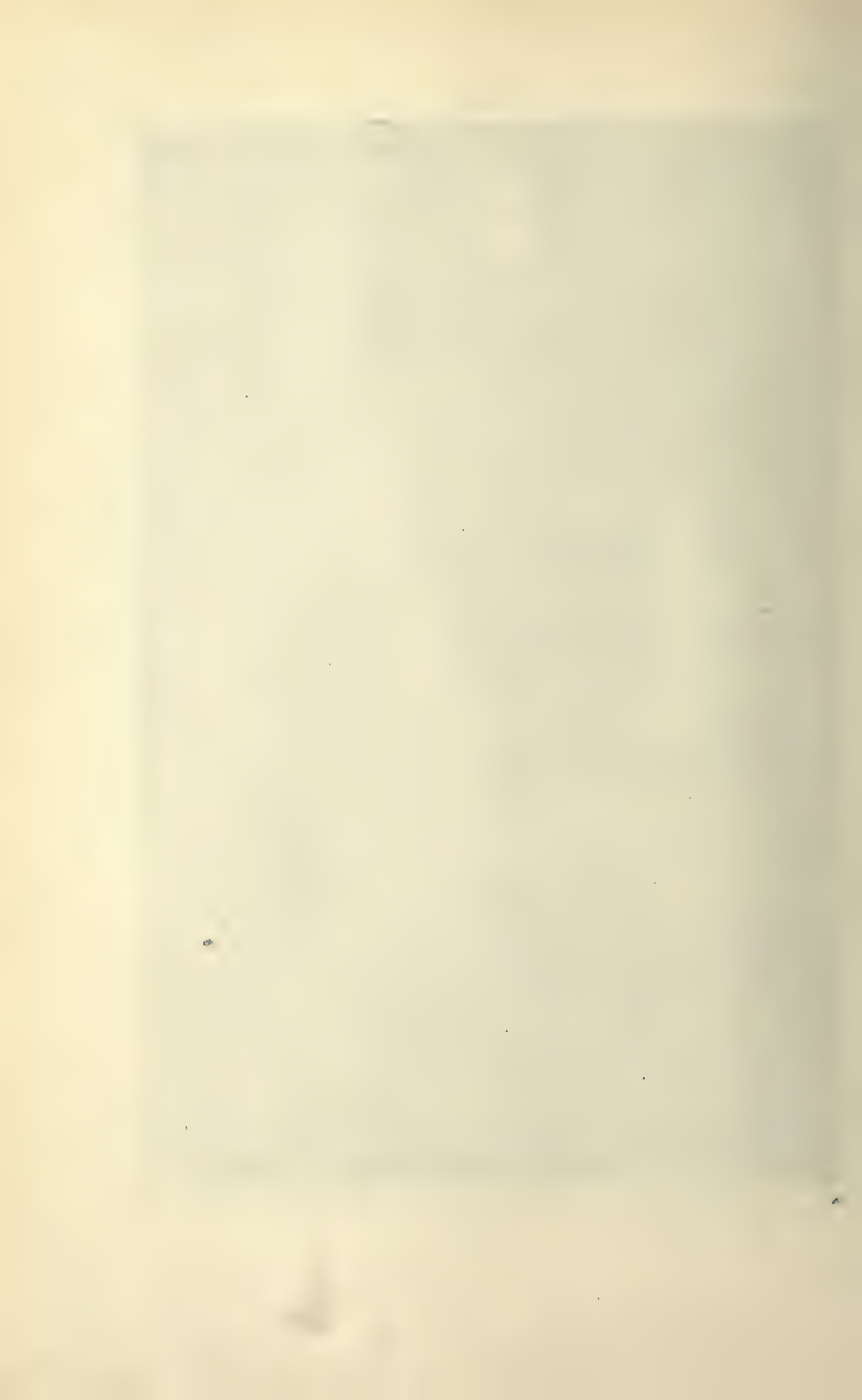
A synopsis of the school system and the school statistics of Illinois for the past 60 years, were exhibited in the room.

The appropriation of \$75.00 a month for an attendant at the school room was divided between two different attendants thus affording poor, yet deserving, teachers an opportunity, at slight cost to them, to visit and study the World's Fair.

In conclusion, I beg to gratefully acknowledge the kind and ready assistance which has been accorded to me by your Committee, as well as the Board of Commissioners.



PUBLIC FREE SCHOOLS' EXHIBIT.



## PUBLIC SCHOOL EXHIBIT.

---

WM. JENKINS, SUPERINTENDENT.

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AT its annual meeting in Springfield, in December, 1890, the Illinois State Teachers' Association appointed a committee of fourteen to prepare and make an Educational Exhibit of Public Education in Illinois at the World's Columbian Exposition then in contemplation.

The Committee met at once and organized by electing Dr. Richard Edwards, State Superintendent of Public Instruction, Chairman, and William Jenkins, Superintendent of Schools, Mendota, Secretary. The Committee adjourned to meet on the 24th day of January, 1891, at Springfield.

At this meeting, with a full Committee present, the whole ground of the contemplated exhibit was gone over, and while little was definitely settled, there was much *clearing up of the ground*, and the relations of the different branches of the work more definitely determined.

A separate educational building for the Illinois exhibit was deemed a necessity, and all plans were based upon this feature. The limitation, which it was subsequently learned had been imposed, made it necessary to abandon all features dependent upon this building.

The exhibit from the University of Illinois, the Illinois Normal University and the Southern Normal University, were to be made by these institutions without reference to the Committee, so that the work it had in charge referred solely to the Rural, Graded, High and Manual Training Schools.

There was little progress during the following months, in the educational work, but during this time the World's Columbian Exposition had been located at Chicago, and the Illinois Board of World's Fair Commissioners had been organized in accordance with an act of the Legislature, approved June 17, 1891, providing "for the participation of the State of Illinois in the 'World's Columbian Exposition,' authorized by an Act of Congress of the United States, to be held in Chicago during the year 1893, in commemoration of the discovery of America in the year 1492, and for an appropriation to pay the cost and expenses of the same."

In October, 1891, a conference between the Committee before mentioned, appointed by the Illinois State Teachers' Association, and the Committee on Education of the Illinois Board of World's Fair Commissioners, was held at the offices of the said Board, in Chicago.

The general character of the exhibit was discussed and the expense necessarily incident considered. The resultant action was the appointment of a sub-committee of the Teachers' Committee, to formulate the details of the exhibit, estimate its expense and nominate a suitable person as Superintendent of the work.

The report of the sub-committee was received, discussed and adopted by the Committee, at Springfield, on the eve of the annual meeting of the State Teachers' Association, in December, 1891.

This was followed by a joint meeting of the Committee on Education of the Illinois Board of World's Fair Commissioners and the Committee of the State Teachers' Association, immediately thereafter, and it was determined that the following appropriation, made by the Illinois Board of World's Fair Commissioners, be approved and accepted by the Committee, and the State Association approve the action of its Committee.

For the University of Illinois.....	\$10,000.00
“ State Normal University .....	2,000.00
“ Southern Normal University. ....	2,000.00
“ Common Schools.....	15,000.00
“ Contingent Fund.....	1,000.00
Total.....	<u>\$30,000.00</u>

The report of the sub-committee in full is attached hereto, and marked “A”.

The appointment of Superintendent of the Common School Section of the Educational Exhibit of Illinois having been tendered to Wm. Jenkins early in February, 1892, and accepted some weeks later, work was immediately commenced.

It was at first necessary to gather information from a number of sources touching the nature, extent and possibilities of the contemplated exhibit.

To this end correspondence was opened with educators in Illinois and elsewhere, teachers’ meetings were visited and addressed, and conferences held with City and County Superintendents of Schools and with the Superintendent of Public Instruction of Illinois.

As a result of this, the following circular, designated “Circular of Information No. 1,” was framed, printed and sent to prominent educators for suggestions. Copies were then sent to all teachers in the State, and in quantities to the County Superintendents and to those of cities.

ILLINOIS BOARD  
OF  
WORLD'S FAIR COMMISSIONERS.  
PUBLIC SCHOOL SECTION.  
—  
CIRCULAR OF INFORMATION NO. 1.  
—  
EXHIBIT OF THE  
PUBLIC SCHOOLS OF ILLINOIS  
AT THE  
WORLD'S COLUMBIAN EXPOSITION.  
—

CLASS A—RURAL SCHOOLS.

MATERIALS FOR EXHIBITS.

1. Designs of school houses, to include floor plans, methods of heating and ventilating, with photographs of characteristic exteriors and interiors.
2. Apparatus and appliances used in teaching, including maps, charts, reference books, globes, blackboards, kindergarten busy-work materials, etc.
3. Selected collections of the work of pupils, the concrete results, including examination work, essays, outlines, mountings, manual work, etc.
4. Free-hand and instrumental drawing and mapping.
5. Photographs of groups, and classes of pupils and of all matter that can be shown best in this way.
6. Full sets of text books, including supplementary and collateral reading matter.
7. Printed courses of study and manuals of directions for teachers, circulars of advice, examination questions, final, central and district forms of reports to superintendent, to parents, etc.

For this work, the unit is the county, and all material is to be prepared and forwarded under the direction of the County Superintendent of Schools.

### CLASS B—GRADED SCHOOLS.

#### MATERIALS FOR EXHIBIT.

1. Designs of graded school houses, to include floor plans, elevations, methods of heating, lighting, ventilating and sanitation, with photographs of characteristic exteriors and interiors.

2. Apparatus, appliances, devices, models and materials used in teaching in each of the eight grades.

3. Selected collections of the work of pupils, including examination work and essays, outlines, reports of observations, development lessons, addresses etc., with or without the teachers' correction.

4. Free-hand and instrumental drawing and mapping.

5. Photographs of groups of pupils, classes at work, in gymnastic drill, and of all matter that can be shown best in this way.

6. Collections of stones, minerals, woods, birds, nests, insects, grains, grasses, foods, condiments, shells, products of dissection, etc., illustrative of different branches of study.

7. Products of manual training, whether the direct result of instruction or otherwise.

8. Full sets of text books, supplementary and collateral reading reference books, maps, charts, magazines, and newspapers, suitable for school use.

9. Printed courses of study, manuals of directions, blanks, reports, records, etc., bound, and in folio leaflets, for distribution if desired.

For this work the unit is the city or town, and material is to be prepared and forwarded under the direction of the City Superintendent of Schools, or other corresponding officer.

## CLASS C—HIGH SCHOOLS.

## MATERIALS FOR EXHIBIT.

1. Same as No. 1 in Class B applied to high school buildings.

2. A chemical laboratory with suitable appliances and materials. Apparatus illustrating elementary physics as presented in high school work.

Materials, instruments and appliances for biological study.

Cabinets of material for geological and mineralogical study.

3. Selected collections of the work of pupils, including examination work and essays, outlines, reports of observations, development lessons, lectures, addresses, etc., with and without the teachers' corrections. Products of pupils' work in chemistry, physics, botany, entomology, etc. Apparatus designed and made by pupils, and collections for nature study.

4. Free-hand and instrumental drawing, crayon, pastel and water color work.

5. Photographs of groups of pupils, classes at work, laboratories and libraries in use, gymnastic drill, and all matter that can be shown best in this way.

6. Same as No. 6 in Class B enlarged to apply to high school work.

7. Products of manual training whether the direct results of instruction or otherwise, including girls' work, such as sewing, darning, fashioning garments, etc.

8. Same as No. 8 in Class B as applied to high school work, and in addition thereto, a collection of standard works on pedagogy, political economy, history, poetry, fiction, etc.

9. Printed courses of study, manuals of direction, as in No. 9 of Class B.

For this work the high school is the unit, and the material is to be prepared and forwarded under the direction of the principal or the superintendent of the system of which the high school is a part.

#### CLASS D—MANUAL TRAINING.

1. Manual training appliances for working:
  - (a) In wood.
  - (b) In iron.
2. Exhibit of pupils' work.

#### CLASS E—NORMAL SCHOOLS.

Exhibit to be made under the direction of their officers.

#### CLASS F—MISCELLANEOUS.

1. Sets of catalogues and reports of public schools
2. Set of reports of the Superintendents of Public Instruction.
3. Statistics.
4. Collection of old text books, photographs of old school houses, etc.

#### REMARKS.

The amount of matter that is desired from each of the units contributing, will be determined later, and due notice given.

The purpose is to give the utmost possible opportunity for the schools to make the most significant exhibit of the plans, purposes, results and prospects of their work. The foregoing outline, while designed to be largely directive, is still to be considered as suggestive, and variations which do not violate its purpose may be expected.

The written matter is to be on paper eight inches wide and ten and one-half long, with an inch margin at the left side for binding.

Mounts, drawings, etc., for wall display, as far as possible, should be twenty-two inches wide and twenty-eight inches high.

Smaller drawings should be grouped upon cards of the same size.

Photographs should be eight inches high by ten inches wide.

The material may be prepared at convenience. It will doubtless be desirable to prepare the exhibit in botany during the present school year.

Should it be thought best to prepare any part of the work upon the basis of a uniform set of questions, due notice of the time and conditions will be given.

The material is to be forwarded to Chicago on or before the first day of March, 1893.

Special directions for this purpose will be issued in due time. Supplementary circulars of information will be issued as needed. Meantime, any inquiries will receive attention.

WM. JENKINS,

*Supt. Public School Sec. of Educational Exhibit of Illinois.*

MENDOTA, ILL., March 14, 1892.

HENRY RAAB,

*Supt. of Public Instruction of Illinois.*

In a report to the Director-in-Chief, under date of April 24, 1892, is the following concerning this circular:

"This circular is essentially an outline designed to give a comprehensive view of the plan and main purpose of the exhibit. It is to be followed by others of more detailed and specific information.

"One of the chief purposes of this exhibit I conceive to be the information of the people. It is not simply nor primarily for the benefit of educators. To this end it is necessary to present it in as graphic a manner as possible, so that much close and critical examination

may not be demanded to perceive its spirit and significance. The work best suited for this purpose is not in so advanced nor uniform a condition as other branches of public education in this State."

There was, consequently, prepared a circular upon Drawing, Modeling and "Making," a copy of which is subjoined herewith:

ILLINOIS BOARD  
OF  
WORLD'S FAIR COMMISSIONERS.  
PUBLIC SCHOOL SECTION.

---

CIRCULAR OF INFORMATION NO. 2.

---

EXHIBIT OF THE  
PUBLIC SCHOOLS OF ILLINOIS,  
AT THE  
WORLD'S COLUMBIAN EXPOSITION.

---

SCHEME FOR EXHIBIT IN DRAWING, MODELING AND MAKING.

---

DRAWING EXHIBIT.

All work in this department should be grouped in the following manner:

- Group I. Constructive Drawing.
- Group II. Representative Drawing.
- Group III. Decoration.
- Group IV. Modeling.
- Group V. Making.

While all schools may not find it practicable to show all the varieties of work mentioned in each group, it is desirable that they should comply with the arrangement as far as possible.

## SCHEME FOR RURAL AND GRADED SCHOOL EXHIBIT.

## CONSTRUCTIVE DRAWING.

- A. From geometric solids (free-hand).
- B. From useful objects based upon geometric solids (free-hand).
- C. From geometric plane tablets (free-hand).
- D. From paper folding and patterns (free-hand).
- E. Geometric problems and applications (instrumental).
- F. Machine drawing.
- G. Architectural drawing.
- H. Illustrative drawing applied to other studies.

## REPRESENTATIVE DRAWING.

- A. From geometric solids.
- B. From objects based on geometric solids.
- C. From miscellaneous objects, as fruits, vegetables, flowers, etc.
- D. Illustrative drawing as applied to other studies. It may be imaginative, from memory, from the object, or copied.

## DECORATION.

To be drawn in outline, made of colored paper, painted in water color, or modeled in clay.

- A. Arrangement of geometric plane tablets for borders and rosettes.
- B. The repetition of units of design, made by modifying geometric plane figures, in borders, rosettes and surface coverings.
- C. The conventionalization of plant forms and the application of the units in industrial design.
- D. Copies of historic ornament. Original arrangements of the elements of good ornament for applied design.

E. Illustrative drawings as applied to other studies—the drawing of historic ornament in connection with the study of history.

#### MODELING.

- A. Geometric solids.
- B. Objects based on geometric solids.
- C. Developing surfaces by impressing the faces of the solids in clay.
- D. Modeling natural and conventional plant forms.
- E. Modeling historic ornament.

#### MAKING.

- A. Paper folding and cutting for the making of geometric shapes, stars, rosettes and other decorative forms.
  - B. The making of patterns for geometric solids and for useful objects based on them.
  - C. The making of solids and objects from the patterns.
  - D. Miscellaneous articles.
- Objects may be made of any available material representing weaving, folding, cutting, and pasting, sewing, carving and carpentry.

#### SCHEME FOR HIGH SCHOOL EXHIBIT.

##### CONSTRUCTIVE DRAWING (INSTRUMENTAL).

- A. Geometric construction.
- B. Orthographic projection.
- C. Isometric projection.
- D. Machine drawing.
- E. Mechanical perspective.
- F. Development of patterns.
- G. Pattern making.
- H. Constructive design.

## REPRESENTATIVE DRAWING.

To be done with pencil, pen and ink, charcoal, crayon, and water color in outline and light and shade.

- A. From geometric solids.
- B. From common objects based on geometric solids.
- C. From fruits, vegetables and flowers.
- D. From casts.
- E. From buildings in wholes or parts, interiors and exteriors.
- F. From natural scenery.
- G. Illustrative drawing as applied to other studies.

## DECORATION.

To be done in pencil, pen and ink, charcoal, crayon, colored papers and water colors.

- A. Historic ornament in outline, light and shade and color.
- B. Applied design, using motives from historic ornament.
- C. Original arrangements of conventional plant forms for industrial design.

## MODELING.

- A. Historical ornament and naturalistic forms from casts.
- B. Original design from applied purposes.
- C. Original work from nature.

## MAKING.

- A. Sewing.
- B. Wood carving.
- C. Representative exercises from the Manual Training School.

All work exhibited should be entirely that of the pupil, and as far as possible be done in the school room, under the supervision of the teacher.

An illustration showing the arrangement that will be made for displaying drawings, color work, clay modeling and made articles, will be sent out shortly. It provides for mounting cards 28 inches high and 22 inches wide.

One design may occupy the card or several may be grouped thereon.

This scheme is designed to be purely suggestive, and to be as full as present conditions will permit. Every school is expected to be as free as possible to exhibit its best work in the best way with as few restrictions as possible.

Inquiries will receive prompt attention.

WM. JENKINS,

*Supt. Public School Sec. of Educational Exhibit of Illinois.*

Room 18, Montauk Block, Chicago.

HENRY RAAB,

*Supt. of Public Instruction of Illinois.*

Rooms of Illinois Board of World's Fair Commissioners.

Approved:

JOHN P. REYNOLDS,

*Director-in-Chief.*

Circular of Information No. 3, giving "Directions Respecting Selection, Arrangement and Forwarding Materials," was prepared towards the close of 1892, and sent in quantities to the superintendents and teachers of the State, and is as follows, marked "B:"

The estimate for floor space needed in which to install the exhibit and a catalogue of the exhibit made, are subjoined, together with a list of the school buildings selected for the architectural exhibit.

I include also a catalogue of the Chicago public school exhibit, which, although installed separately, was under the control of the Illinois Board of World's Fair Commissioners, and formed an important part of the State exhibit.

Respectfully submitted,

WM. JENKINS,  
*Supt. Common School Section Illinois Board  
 World's Fair Commissioners.*

#### ESTIMATE OF FLOOR SPACE.

The estimate for floor space needed for the exhibit, exclusive of the Model School Room, was submitted May 7, 1892, as follows:

For Class A (Circular of Information No. 1)	2,000 sq. feet.
" " B "	2,500 "
" " C "	2,500 "
" " D "	1,500 "
" " F "	500 "

Total.....9,000 sq. feet.

This estimate was reduced to 4,032 sq. feet, which, with space assigned to the Model School Room and work room, aggregated very nearly 6,000 sq. feet of floor space devoted to the Public School Exhibit.

The space was not sufficient, and as a consequence many changes in the installation were rendered necessary in order to exhibit the material received. Even by making as many changes as possible the results were far from being as satisfactory as they would have been had the space been larger.

## CATALOGUE

OF THE PUBLIC SCHOOL SECTION OF THE ILLINOIS  
STATE EDUCATIONAL EXHIBIT.

This exhibit was installed in the northeast part of the Illinois State Building upon the main floor.

It consisted in the main of written exercises bound in volumes representing all grades of school work and mounts illustrating the same, together with an architectural exhibit.

The volumes were distributed in cases so that each front of a case contained work of a similar year or grade, throughout. The design was to illustrate the work of the State, as a whole, but at the same time to preserve the continuity of work from each school or system of schools as far as possible.

The work was installed in eighteen cases, exclusive of the exhibit from the city of Chicago, which is separately catalogued.

Six of the cases carried glazed show cases in which were manual training, clay, paper, folding, other kindred kinds of work, and material for Nature study.

## RURAL SCHOOLS.

In the four cases with screens at the east side, was the work from rural schools arranged by grades commencing with the first year or grade on the front of the first case, the second year or grade on the other side of the first case, the third year or grade on the front of the second case, and so on for the eight grades.

## GRADED SCHOOLS.

The four large cases with screens in the middle, contained the work from graded schools arranged by grades, commencing with the first grade on the front of the first

case or screen, the second grade on the other side of the first case or screen, the third grade on the front side of the second screen, and so on for the eight grades.

#### HIGH SCHOOLS.

In the four cases at the west side were the work of the high schools arranged by years commencing with the first year, on both sides of the first case, second year on both sides of the second case, and so on for the four years.

#### ARCHITECTURAL EXHIBIT.

Fourteen school houses, showing exterior elevations, accompanied with floor plans, methods of heating, lighting, ventilation and sanitation.

##### *High School Buildings:*

N. W. of Chicago.

Freeport.

Aurora.

##### *Graded School Buildings:*

Chicago, Bancroft School.

Mendota, Blackstone School.

Farmington School.

Trenton School.

Alton Ward School.

Peoria, Greeley School.

Lawrenceville School.

Cairo, Lincoln School.

Harvard School.

##### *Rural School Buildings:*

Chester School, Champaign county.

Sunny-Side School, Shelby county.

## INVENTORY.

## RURAL AND VILLAGE SCHOOLS.

Counties.	Volumes.	Mounts.
Alexander.....	10	.....
Bureau.....	26	27
Christian.....	7	.....
Champaign.....	30	3
Carroll.....	5	.....
Clark.....	18	.....
Champaign (Mahomet)	3	.....
DeKalb.....	Examination papers unbound.	
DeKalb (Kirkland).....	Examination papers & drawings.	
Edwards.....	3	.....
Effingham.....	20	.....
Fayette.....	12	1
Ford.....	21	8
Jasper.....	14	.....
Kendall.....	6	6
Kendall.....	Production Maps 2, portfolio 1.	
Lawrence.....	14	.....
LaSalle.....	20	7
Monroe (Columbia).....	3	.....
Macon.....	59	5
Moultrie (Fairview).....	3	.....
Moultrie (Lake City)...	7	.....
Madison.....	9	.....
Mason.....	6	2 pictures.
Ogle.....	51	25
Peoria.....	13	12
Piatt.....	168	.....
Piatt (Pierson).....	3	.....
Pulaski.....	6	.....
Rock Island.....	10	.....
Rock Island (E. Milan)	.....	15
Sangamon.....	17	.....

*Rural and Village Schools—Concluded.*

Counties.	Volumes.	Mounts.
Stephenson.....	19	31
Vermilion.....	21	29
Warren.....	21	.....
Warren.....		Book botany mounts.
Washington.....	18	40
Will.....	49	.....

## INVENTORY.

## GRADED WORK.

Counties.	Vols.	Mts.
Assumption.....Christian.....	8	
Adeline.....Ogle.....	4	
Altamont.....Effingham.....	4	
Albion.....Edwards.....	15	
Austin.....Cook.....		21
Aurora (W. Side).....Kane.....		100
“ “ “ clay mouldings.		
“ “ “ paper models.		
“ (E. Side).... “ .....	36	95
Ashley.....Washington.....	1	
Batavia.....Kane.....		48
Bement.....Piatt.....	8	
Bridgeport.....Lawrence.....	8	
Carmi.....White.....	19	34
Cairo.....Alexander, 2 vols. of Cat .....	14	
Columbia.....Monroe.....	1	
Canton.....Fulton.....	11	70
Dixon (South).....Lee.....	21	
“ (North)..... “ .....	10	
DesPlaines.....Cook, 1 panorama .....	21	12
Germantown.....Vermilion.....	5	5
Effingham.....Effingham.....	9	

*Graded Work—Continued.*

	Counties.	Vols.	Mts.
Elmhurst.....	Cook, specimens of wood....	9	24
“ .....	“ picture school house.		
Elgin.....	Kane, sewing, making clay work.....	12	140
Evanston (South).....	Cook .....	17	
Freeport.....	Stephenson.....	14	49
Forreston.....	Ogle.....	5	10
Galesburg.....	Knox, woodwork, clay work picture .....	29	85
Gibson City.....	Ford .....	10	9
Henry.....	Marshall .....	6	
Joliet.....	Will, 20 photos. of buildings.	20	
Kankakee.....	Kankakee .....	18	24
“ .....	“ phys'l app., photo 1.		
Kewanee.....	Henry .....	22	105
Lawrenceville.....	Lawrence .....	7	3
Lanark.....	Carroll .....	7	13
LaSalle.....	LaSalle, relief map photos..	14	60
Lovington.....	Moultrie.....	7	
Lena.....	Stephenson .....	6	
Monticello.....	Piatt.....	18	43
Monmouth.....	Warren, paper f'ld'g, 2 charts	22	87
Mt. Carmel.....	Wabash .....	16	
“ .....	“ one roll drawings.		
Morris.....	Grundy, fossils .....	14	27
Momence.....	Kankakee, physical appara- tus, framed matter.		
Momence.....	Kankakee, zoölogy sp'cim'ns.		
Mt. Carroll.....	Carroll .....	5	7
“ .....	“ 21 vols. primary work, 1 scrapb'k, 1 product'n card.		
Marseilles (East)...	LaSalle.....	12	
Marseilles (West)...	LaSalle .....	4	

*Graded Work—Continued.*

	Counties.	Vols.	Mts.
Mound City.....	Pulaski, book press'd flower.	12	
Melvin .....	Ford .....	8	
Newton.....	Jasper.....	19	42
Nashville.....	Washington.....	11	
Newman .....	Douglas .....	18	36
Naperville.....	DuPage.....	12	
Ottawa.....	LaSalle, photo...	11	15
O'Fallon.....	St. Clair.....	6	8
Oregon.....	Ogle.....	10	23
Princeton .....	Bureau.....	4	78
Peru.....	LaSalle.....	21	20
Pittsfield.....	Pike, 1 silk map.		
Paxton.....	Ford .....	9	
Peoria.....	Peoria.....	10	134
Quincy.....	Adams.....	6	4
Rogers Park.....	Cook.....	12	25
Rochelle.....	Ogle.....	7	
Rockford.....	Winnebago, 8 photos, paper work, clay work.....	27	191
Rantoul.....	Champaign.....	5	
Rock Falls.....	Whiteside.....	10	
Springfield.....	Sangamon, wood work, clay work.....	17	20
Sterling (Sterling).	Whiteside.....	13	27
Sterling (Wallace).	".....	8	3
Sterling (Hamm) ..	" 2 drawings.		
Sheffield.....	Bureau.....	8	18
Sullivan.....	Moultrie.....	14	30
Streator.....	LaSalle.....	18	
Shannon.....	Carroll.....	6	12
Sumner.....	Lawrence.....	18	
Savanna.....	Carroll, relief map, wood work, 2 glass cases.....	8	25

*Graded Work—Concluded.*

	Counties.	Vols.	Mts.
Sibley .....	Ford, cases of ore.....	11	10
Sadorus.....	Champaign .....	3	
Sandwich.....	DeKalb, clay work.....	5	37
Taylorville .....	Christian.....	5	
Wheaton .....	DuPage.....	13	12
Winchester .....	Scott.....	8	11
Wenona.....	Marshall .....	9	
Yorkville.....	Kendall.....	4	

## INVENTORY.

## HIGH SCHOOLS.

	Counties.	Vols.	Mts.
Bement.....	Piatt.....	6	
Carmi .....	White.....	10	
Cairo .....	Alexander.....	13	
Canton .....	Fulton .....	4	
Dixon (South) .....	Lee.....	9	
“ (North).....	“ .....	4	
Elmhurst.....	Cook .....	3	
Elgin .....	Kane.....	19	
Evanston Tp. High School.....	Cook .....	30	17
Evanston Tp. High School.....	Cook, 75 pictures.....		17
Freeport.....	Stephenson .....	5	
Galesburg.....	Knox .....	11	
Henry.....	Marshall .....	2	
Kankakee.....	Kankakee .....	9	
Kewanee.....	Henry .....	6	
Lanark .....	Carroll .....	7	
LaSalle.....	LaSalle .....	14	
Lovington.....	Moultrie.....	1	

*High Schools—Concluded.*

	Counties.	Vols.	Mts.
Monticello .....	Piatt.....	4	
Marshall.....	Clark.....	3	
Monmouth.....	Warren.....	15	
Morris.....	Grundy.....	3	
Mt. Carroll.....	Carroll.....	1	
Minier.....	Tazewell.....	3	
Mound City.....	Pulaski.....	3	
Nashville.....	Washington.....	4	
Newman.....	Douglas.....	22	
Oregon.....	Ogle.....	10	
Ottawa.....	LaSalle.....	22	32
Princeton.....	Bureau.....	25	82
Paxton.....	Ford.....	4	
Peoria.....	Peoria.....	18	
Quincy.....	Adams.....	2	
Rock Island.....	Rock Island, photos.....	10	14
Rochelle.....	Ogle.....	3	
Rockford.....	Winnebago.....	33	
Rock Falls.....	Whiteside.....	2	
Springfield.....	Sangamon.....	18	
Sterling.....	Whiteside.....	4	
Sterling (Wallace).....	Whiteside.....	3	
Sheffield.....	Bureau.....	12	
Sullivan.....	Moultrie.....	3	
Shannon.....	Carroll.....	12	
Savanna.....	".....	3	
Sandwich.....	DeKalb.....	6	
Shabbona.....	" 1 picture.....	15	
Wheaton.....	DuPage.....	1	
Winchester.....	Scott.....	3	
Wenona.....	Marshall.....	6	
Yorkville.....	Kendall.....	4	

**Report of Materials, Space and Funds required for Exhibit  
of the Public Schools of Illinois at the  
Columbian Exposition.**

**CLASS A—RURAL SCHOOLS.**

**MATERIALS OF EXHIBIT.**

1. Designs of school-houses, including floor plans and 20 photos of characteristic exteriors. Also 20 photos of characteristic interiors.

2. Apparatus and contrivances used in teaching, including maps, charts, reference books, globes, blackboards, etc.

3. Printed courses of study, as prescribed in the different counties.

4. Collection of examination work from each county in the State, the same to be bound in pasteboard covers, except five sets, to be permanently bound.

5. Free-hand drawing and mapping.

6. Twenty-five wall-sets of frames for exhibiting photos, drawings, maps and other work of pupils.

7. A series of tables next the walls on which to display pupils' work.

8. Full sets of text and reference books and supplementary reading matter.

**SPACE.**

This exhibit to occupy the room 37x30 over the entrance.

**CLASS B—GRADED SCHOOLS.**

**MATERIALS OF EXHIBIT.**

1. Designs of graded school-houses, including floor plans and 20 photos of exteriors. Also 20 photos of interiors.

2. Apparatus of models, contrivances, etc., used in teaching in the several grades.

3. Printed courses of study for each of the eight grades below the high school, five sets of each grade to be permanently bound, and the rest to be in folio leaflets for distribution.

4. Collections of pupils' examination work for each grade to be similarly treated.

5. Free-hand and architectural drawing, as may be suitable. Also mapping.

6. Twenty-five wall-sets of frames for exhibiting plans, photos, maps, botanical specimens and other appropriate pupils' work.

7. Series of tables next the walls, on which to display pupils' work and school collections of natural objects for nature study, such as collections of stones, minerals, woods, birds, nests, insects, products of dissection of animals, shells, herbaria, etc. These, except the paper work to be under glass.

8. Full sets of text books, supplementary reading, reference libraries, maps, charts and school newspapers.

9. Products of manual training schools and the children's handicraft in general, including all sorts of useful and ingenious articles made by boys and girls, which may be deemed worthy of exhibition.

#### CLASS C—HIGH SCHOOLS.

##### MATERIALS OF EXHIBIT.

1. Designs of high school houses, including floor plans, 20 photos of representative exteriors. Also 20 photos of representative interiors.

2. A chemical laboratory to include a teachers' laboratory desk, and at least four pupils' stalls, fitted up for work in inorganic chemistry, and supplied with proper apparatus, materials and reagents; also a set of the products of school class-work displayed in glass.

3. A series of tables carrying a full set of apparatus for illustrating physics as presented in high school work.

4. A series of tables fitted with the materials, appliances and products of biological study, including plant and animal life and physiology. This will demand a contiguous wall display of charts, botanical, zöological, entomological and physiological, and a display of results of secondary work in all these departments.

5. Tables carrying materials for geological and mineralogical study with cognate wall displays.

6. Tables carrying apparatus contrived by pupils for illustrating science subjects.

7. Printed courses of study.

8. Examination papers, five sets to be permanently bound and the rest put in pasteboard covers.

9. Drawings—free-hand, architectural, perspective, geometrical; also crayon, pastel and water color work; a wall display.

10. School collections for nature study.

11. Full sets of text-books, with supplementary reading, reference libraries and school newspapers.

12. Products of manual training and youths' handicraft, including girls' sewing and fashioning of garments.

13. Twenty-five wall sets of frames for carrying photos, plans, drawings, maps, etc.

#### SPACE.

The N. E. room, 2d floor, 60x30 would contain this exhibit.

#### CLASS D—MANUAL TRAINING AND PHYSICAL CULTURE.

##### MATERIALS OF EXHIBIT.

1. A specimen battery of manual training appliances for working in wood.

2. For working in iron.

3. The different kinds of apparatus and manuals for physical culture, or as much of it as can be accommodated.

4. Full set of base-ball goods and costumes.

5. Full set of foot-ball goods and costumes.

6. Full set of tennis goods and costumes.

#### SPACE.

The galleries, 2d story, would receive this exhibit. 30x60, 1800 square feet space.

#### CLASS E—STATE NORMAL SCHOOLS.

Ask each for 1500 feet of floor space, and might have 50x30 on each floor adjoining that already assigned.

#### CLASS F—MISCELLANEOUS.

1. A complete set of catalogues and reports of such public schools as publish them.

2. A complete set of reports of the Superintendent of Public Instruction.

3. A compend of certain statistics, illustrating the progress of the public schools in Illinois—setting forth the growth in population, the increase in number of children enrolled in the schools, per cent of attendance; number of schoolhouses, number of teachers, expenditures for public schools and exhibited by decades, the same to be printed in cheap leaflet form for distribution everywhere in the educational exhibit.

4. A collection of the oldest text books and apparatus to be found.

ESTIMATE OF THE FUNDS REQUIRED TO CARRY OUT  
THE ABOVE SCHEME.

1. A superintendent of the exhibit "at not less than \$2,500 per annum," for two years.....	\$5,000.00
2. Seven assistants at \$800 each, one for supervision of model schoolroom.....	5,600.00
3. Expenses of superintendent.....	2,400.00
4. Help in receiving, selecting and installing the exhibit.....	1,500.00
5. Freight of goods to and from.....	1,000.00
6. State Normal Schools.....	5,000.00
7. High School Laboratories.. ..	700.00
8. Materials used in laboratories.....	300.00
9. Furnishing the three school rooms.....	1,200.00
10. Furnishing the manual training room..	1,000.00
11. Furnishing the physical apparatus.....	400.00
12. Cost of printing.....	500.00
13. Photography.....	500.00
14. Exhibit of text books, reference library and supplementary books.....	900.00
<b>Total .....</b>	<b>\$26,000.00</b>

FLOOR SPACE.

Besides the three rooms designated above, 4,800 square feet in the adjoining room on the northeast of second floor.

It seems desirable to supplement the foregoing report with the following considerations: First: It is impossible to accurately foresee the exact cost of many of the items which enter into the preceding financial estimate. For instance, Nos. 3 and 4 may be too great, they may be too small; again the cost of the proposed high school laboratories may be greatly lessened by the loan

in great measure of the various articles of apparatus from some furnishing house which would be glad to be thus advertised. Item 8 might be made in like manner disappear. Item 11 likewise, though this is hardly to be anticipated. Item 13 might be possibly brought down to \$300, while item 12 might prove inadequate. The "expenses" of the Superintendent have necessarily to be lumped, and may go either way of the mark. The duties of the Superintendent contemplated in this report are such as to demand the immediate and continuous service of an energetic and expert person, entirely familiar with the ideas sought to be realized through the exhibit and in touch with the educational public of Illinois.

He would need at once, by circulars of information, by visiting educational bodies in session, and by being in personal contact with the schools of the various localities to generate a working interest in the exhibit, and so correlate the efforts that should be made as to bring them into contribution to the ends proposed; this because our public schools are without a centralizing organization through which they may be brought into action.

The Superintendent would need to have oversight of certain necessary expenditures of the funds, as the exhibit should progress; to plan and direct the specific preparation of the room assigned for its various uses; to receive, assort and install the exhibits; to have custody of the same through competent assistants and guides during the Exposition, and to make final disposition of the same at its close. The schools should be gotten in hand and put to work on their preparations at the earliest possible moment, inasmuch as a multitude of deficiencies would disclose themselves subsequent to the first aggregation of their work, which would have to be supplied by a subsequent arrange-

ment. Whether or not a suitable person can be had for this responsibility for the sum named in the estimate is matter of conjecture. It is to be remembered that the duty would spoil three years of a schoolman's time. It has been the endeavor of the Committee to make a conservative estimate of the expenditures required for the realization of an educational exhibit which should be within the limitations prescribed by the law, at least modestly creditable to the State, and in this sense it respectfully submits the same to the consideration of the State Commission.

All of which is most respectfully submitted,

HENRY RAAB,  
*Chairman Sub-Committee.*

"B"

ILLINOIS BOARD  
OF  
WORLD'S FAIR COMMISSIONERS.  
PUBLIC SCHOOL SECTION.

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CIRCULAR OF INFORMATION NO. 3.

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EXHIBIT OF THE  
PUBLIC SCHOOLS OF ILLINOIS  
AT THE  
WORLD'S COLUMBIAN EXPOSITION.

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DIRECTIONS RESPECTING SELECTION, ARRANGEMENT AND  
FORWARDING OF MATERIALS.

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*To School Officers, Superintendents and Teachers of the  
Public Schools of Illinois:*

Circular of Information No. 1, which contained a brief but comprehensive statement of the nature of the exhibit to be made by the Public Schools of Illinois at the World's Columbian Exposition, was issued in March last. In this circular the schools were classified as A Rural Schools, B Graded Schools, C High Schools and D Manual Training Schools, and the character of the exhibit from each of these classes was set forth.

It is deemed best in this circular to repeat so much of Circular of Information No. 1 as may be necessary to make it clear to those who may not have that circular at hand. It is the intention, furthermore, to give final instructions respecting the arrangement, selection and forwarding of materials desired from each of the classes of schools mentioned.

The work desired from Rural Schools is:

"Collections of the work of pupils, including examination work, essays, outlines, mountings, manual work, free-hand and instrumental drawing."

"Photographs of groups and classes of pupils and of all matter that can be shown best in that way."

From Class B., Graded Schools:

"Collections of the work of pupils, including examination work, essays, outlines, reports of observations, development lessons, free-hand and instrumental drawing."

"Photographs of groups of pupils, classes at work in gymnastic drill and of all matter that can be shown best in that way."

"Collections of stones, minerals, woods, birds, nests, insects, grains, grasses, condiments, shells, products of dissection, mounted botanical specimens, in cases or on cards 22x28 inches."

"Products of manual training, whether the direct results of instruction or otherwise, also mounted on boards 22x28 inches wherever possible. In other cases to be exhibited on tables or in glass covered cases, on shelves or brackets."

From Class C., High Schools:

"Collections of pupils' work similar to those mentioned in Class B., and in addition thereto products of pupils' work in chemistry, physics, botany, entomology, apparatus designed or made by pupils, and collection for nature study, mounted or prepared for exhibit as in Class B."

"Free-hand and instrumental drawing, crayon, pastel or water color work."

"Photographs of groups of pupils, classes at work, laboratories and libraries in use, instantaneous views of classes at work."

"Products of manual training, whether the direct results of instruction or otherwise, including girls' work, such as sewing, darning, fashioning garments, etc.

The intention, as expressed in Circular No. 1 to give the utmost possible opportunity for the schools to make the most significant exhibit of the plans, purposes and results of their work, has been kept steadily in view.

### MATTER OF EXHIBIT.

#### TABLE DISPLAY.

What to exhibit, therefore, cannot be definitely stated without limiting the freedom necessary to secure the best results. The exhibit as a whole should indicate what the schools are aiming to do, what they are accomplishing, and as far possible in what way. To this end it should consist of representative work from every grade and department of the public school system. Exactly what the contribution shall be from any particular school or system of schools cannot be specified, but inasmuch as suggestions have been frequently requested, the following are offered in the hope that they may prove helpful:

A series of eight volumes, one for each grade or the work of two or more grades bound together upon language work, including reading, spelling, penmanship, language and grammar. This might show the methods of teaching reading, subject analysis, dictation exercises, pictures, stories, abstracts, methods of teaching definitions, paraphrases, reproduction, letters, business forms, imaginary descriptions and narration and other essays, grammatical analysis and parsing and translations.

A similar series of volumes for number work or arithmetic to show methods and results in primary work, in securing accuracy and rapidity, in developing the reasoning powers, clearness of conception in applied knowledge, solutions, test statements of definitions, principles, abbreviated methods and business forms.

Another set for elementary science work which would include in botany, charts, drawings, analysis, mounted specimens, woods, leaves, fruits, seeds, etc., in accompanying mounts or cases. In zoölogy, dissections of and mounted specimens of animals, with drawings and specimens of birds, nests, eggs, insects, shells, etc., in accompanying cases. In physiology, of diagrams, drawings, definitions, products of dissection, recitations and essays. In geography, of drawings, diagrams, maps, graphic representation and written observations of outdoor work, topical and other recitations, etc. These would include science work from the most elementary to the most advanced, or any part of it.

A similar series of volumes, each of which should contain selections showing the entire work of one or more grades. Additional volumes showing the work of whole classes, in different subjects.

Similar series of volumes as needed for high schools, increased as to number of topics as the enlarged curriculum demands.

Other arrangements may in many cases be deemed better, if so, these suggestions will not stand in the way.

The writing should be in ink in all cases except early primary work and drawings, in which pencil work will be accepted.

Photographs of pupils at work may be bound as illustrations in the volumes of their manuscript.

### MOUNTED WORK, FOR WALL AND WING FRAME DISPLAY.

1. Circular of Information No. 2, covers this matter in the line of drawing in detail. The general heads only will be reproduced here. The circular will be sent to anyone desiring the details, and who may not have it at hand.

All the work in this department should be grouped in the following manner:

- Group I. Constructive Drawing.
- Group II. Representative Drawing.
- Group III. Decoration.
- Group IV. Modeling.
- Group V. Making.

2. Mounted work, including maps, charts, photographs, manual work, products of dissections, botanical specimens.

3. Shelf or Bracket Display: Models, apparatus, zoological and entomological mounts, maps, clay and putty work.

Portfolios are not recommended for any purpose, but will be accepted.

### MATERIALS.

The card board used for mounted work of any kind should be 28 inches long by 22 inches wide, the long side to be vertical. It should be six ply and court grey or light drab in color.

One design or a group on each card.

For all written work to be bound, the paper should be not less than 8 inches wide and  $10\frac{1}{2}$  inches long, nor more than  $8\frac{1}{2}$  inches wide and 11 inches long.

1 inch to  $1\frac{1}{2}$  ruled from left side for binding.

The length of paper is from top to bottom of the page.

Binding at left side, not top.

An excellent quality of paper,  $8 \times 10\frac{1}{2}$  inches, ruled on one side, can be bought for \$1.05 per 480 sheets.

The paper should be ruled and the writing appear on one side only. It should be of good, firm quality, weighing about 6 pounds per 480 sheets.

Care should be taken that all mounts be firmly secured, and in case of pasting, the best quality of mucilage or alcoholic glue should be used.

#### EXPENSE.

All expense of transporting the exhibit to the Fair and returning it, all expenses of installation and care during the six months of the Fair will be borne by the Commission. And in addition thereto it is probable that a considerable percentage of bills for materials, binding and mounting, can also be paid, although that was not considered in the estimates of the Committee of the Illinois State Teachers' Association.

The original bills rendered for these purposes should therefore be carefully preserved.

#### HEADINGS.

A printed heading with the blanks filled for the first page only, is recommended to be used by each pupil, in each subject. Following pages should have the pupil's name at the left end, the subject in the middle, and the number of the page at the right end, of first line.

For Rural Schools.

Heading for Papers.

#### PUBLIC SCHOOLS OF ILLINOIS.

##### RURAL SCHOOLS.

County.....

Subject.....

Name..... Age..... Year or grade.....

District No..... Township No..... R..... P. M.

Teacher.....

Remarks.....

## For Graded Schools.

## PUBLIC SCHOOLS OF ILLINOIS.

## GRADED SCHOOLS.

City.....  
 Subject.....  
 Name..... Age..... Grade.....  
 Teacher.....  
 Remarks .....

## For High Schools.

## PUBLIC SCHOOLS OF ILLINOIS.

## HIGH SCHOOLS.

City or Township.....  
 Subject.....  
 Name..... Age..... Year.....  
 Teacher.....  
 Remarks .....

Under the head of remarks may be stated the time of writing the paper and any other conditions that will aid in understanding it. Similar statements in compact form should be affixed to mounts.

## BOUND VOLUMES.

There should not be more than 50 to 75 leaves to a book; less would be preferable.

The books should be plainly and strongly bound in black muslin or similar material, and labeled on the outside of front cover as follows:

For Rural Schools (Class A).

PUBLIC SCHOOLS OF ILLINOIS.

RURAL SCHOOLS.

County.....  
Subject.....

.....  
*County Superintendent of Schools.*

For Graded Schools (Class B).

PUBLIC SCHOOLS OF ILLINOIS.

GRADED SCHOOLS.

City.....  
Subject.....

.....  
*Supt. or Prin.*

For High Schools (Class C).

PUBLIC SCHOOLS OF ILLINOIS.

HIGH SCHOOLS.

Name of High School.....  
Subject.....

.....  
*Principal.*

And on the back of the volumes the name of the county, city or high school put in bold lettering lengthwise.

These labels may be written, printed, partly written and partly printed, or stamped in gilt.

#### SHIPPING DIRECTIONS.

It is recommended that shipping boxes be made 27 by 30 inches inside measure as deep as needed and top screwed on, not nailed. These will be suitable for bound volumes and mounts.

Special boxes may be needed for other matter.

## ADDRESS.

The boxes should be addressed:

WILLIAM JENKINS,  
Supt. Public School Section,  
Illinois State Building,  
Jackson Park,  
Chicago, Ill.

From .....

.....

.....

An invoice of contents should be enclosed in each box and a copy sent by mail to the same address.

Forward all matter by express, *not* prepaid. The charges will be paid here. It should be shipped during March, 1893, and as early in the month as may be.

## CLASSIFICATION.

By the conditions of Circular of Information No. 1, which was projected upon the decision reached by the committee appointed by the Illinois State Teachers' Association, the smallest unit of representation for Rural Schools was the county; for the Graded Schools the city or town. Each High School was a unit by itself.

It is recommended that the county superintendents of schools upon the receipt of this circular call meetings of the teachers of their respective counties, preferably in connection with a Saturday institute, and decide upon the best methods of procedure in each case, in preparing, gathering and selecting the work.

No questions will be sent out from this office.

It is further recommended that the work from the Rural Schools be sent to the county superintendent, who, with a committee of teachers, or otherwise, may make such a selection as may be deemed best to represent the Rural

Schools of the county, have it bound or mounted, as the case may be, and forward, as directed in this circular.

Superintendents or principals of Graded or High Schools should proceed similarly.

#### CLASSIFICATION OF SCHOOLS.

For the purpose of indicating approximately the quantity of work desired from each of the three classes of schools (A, B and C) a classification of counties upon the basis of the number of schools in each has been made for the Rural Schools (A). A classification of cities upon the basis of the number of teachers employed in each system has been made for Graded Schools (B). A classification of High Schools (C) upon the basis of:

1. Those managed by a corps of teachers exclusively engaged in high school work, and

2. Those which are in part or wholly under the instruction of teachers part of whose duties is instruction or supervision of other grades of work.

#### CLASSIFICATION OF COUNTIES.

##### CLASS I—OVER 400 SCHOOLS.

Cook.

##### CLASS II—314-175.

LaSalle.  
Champaign.  
Vermilion.  
Hancock.  
Moultrie.  
McLean.  
Bureau.  
Will.

Henry.  
Ogle.  
Iroquois.  
Fulton.  
Adams.  
Knox.  
Sangamon.  
Livingston—16.

## CLASS III—175-100.

Kane.	Ford.
Macoupin.	Jasper.
Pike.	Lake.
Coles.	Mercer.
Kankakee.	Randolph.
McHenry.	White.
Stephenson.	Lee.
Whiteside.	Peoria.
Clark.	Christian.
Jackson.	Fayette.
JoDavies.	Madison.
Marion.	St. Clair.
Piatt.	Wayne.
Tazewell.	Carroll.
DeKalb.	Grundy.
McDonough.	Jefferson.
Shelby.	Logan.
Edgar.	Morgan.
Macon.	Rock Island.
Montgomery.	Williamson.
Warren.	Woodford—43.
Winnebago.	

## CLASS IV—LESS THAN 100.

Bond.	Clinton.
Cumberland.	Henderson.
DuPage.	Kendall.
Greene.	Perry.
Marshall.	Stark.
Saline.	Calhoun.
Washington.	Putnam.
Cass.	Crawford.
Gallatin.	Douglas.
Johnson.	Franklin.
Monroe.	Lawrence.

*Class IV—Concluded.*

Pulaski.	Richland.
Alexander.	Union.
Massac.	Brown.
Clay.	Edwards.
DeWitt.	Jersey.
Effingham.	Menard.
Hamilton.	Pope.
Mason.	Wabash.
Schuyler.	Hardin.
Boone.	Scott—42.

**FROM RURAL SCHOOLS—CLASS (A).**

From the county class I, it is desired to receive approximately, bound matter, 30 volumes; mounts, 120. From each county of class II, bound matter, 25 volumes; mounts, 75. From each county of class III, bound matter, 20 volumes; mounts, 50. From each county of class IV, 10 volumes bound matter and mounts 25.

**FROM GRADED SCHOOLS—CLASS (B).**

From systems of graded schools employing 500 teachers or over, 100 volumes, 400 mounts. From systems employing 75 to 500 teachers, 40 volumes, 150 mounts. From systems employing 25 to 75 teachers, 20 volumes, 80 mounts. From systems employing 10 to 25 teachers, 15 volumes, 50 mounts. Graded schools employing less than 10 teachers, 8 volumes, 20 mounts.

**FROM HIGH SCHOOLS—CLASS (C).**

From each high school, class C, 1 and 2, a sufficient number of volumes and mounts to fully represent its work, together with any other matter that cannot be thus classified. It is hoped to make the exhibit of secondary schools as full, striking, suggestive and instructive as possible.

The possible aggregate may seem large, but it is not expected that the full amount of work indicated will be secured in every case. Furthermore it must be borne in mind that enough of material is needed to make at least six entire changes in the exhibit, one for each month. It is the intention also to classify these changes to conform to the classification of schools as far as may be found practicable.

#### ADMINISTRATION.

It is desired to receive from boards, superintendents, principals and teachers, courses of study, manuals of directions, reports of boards, circulars, examination questions, district, central and final, and for other purposes, reports to parents, blanks, library cards, etc., used in the administration of schools, bound in the same manner, as nearly as may be, as the manuscript work of the pupils.

#### HISTORY.

Correspondence is solicited from parties who may have old text and exercise books, views of old school houses, log or otherwise, historical sketches devoted to educational matters in Illinois, biographical sketches, portraits of noted teachers, and all similar matter.

The value of the exhibit will depend upon the honesty of purpose and the integrity of conduct of all connected with it. In this connection I quote without reservation the following words upon this point as applicable to work presented as the *product of the pupils exclusively*:

"Every item of work presented as the product of the pupils, should be absolutely genuine. The interference of a teacher, even to the correction of an obvious mistake, the retouching of a shade in drawing, the fitting by a shaving of a joint of woodwork, the dotting of an "i," or the crossing of a "t," should be deemed an inexcusable fault; any work so "improved" should be

rigorously rejected. Each item should be forwarded exactly as the pupil left it. No special instruction, practice or drill should be given to any pupil, class or school, preparatory to work which is intended for the Exposition. The actual fruits of the regular school system should be presented without being worked up for this special purpose."

"It will happen that in a given city one school will win the honor of sending forward the representative class in one subject, another in another, and so on. It will be possible that every community which is really excelling in some particular, may have the honor of being represented in something in the final selection."

In case the work is to appear with correction, by the teacher, these should be placed so as to show exactly what the work was prior to the indicated corrections.

#### REPORT.

As soon as possible after January 20th, 1893, it is desirable that superintendents, principals or committees having authority or responsibility for the exhibit of any school, or system of schools, should report to the undersigned, Superintendent of the Public School Section of the Educational Exhibit of Illinois, stating what grades, variety and amount of work will be contributed.

This report should be in detail as much as circumstances will permit, and be made without reference to any previous statement, oral or otherwise.

#### CONCLUSION.

This circular was intended to be issued about December 1st, but it has been unavoidably delayed.

It is designed, however, for final directions rather than to initiate action. It is supplementary, not introductory.

It is to be hoped that the occasion and the opportunity may not be overlooked nor undervalued.

The time that remains is short and should be diligently improved.

Under the direction of intelligent and zealous teachers there is ample opportunity to make an exhibit of Public School Education in Illinois that shall be at once an honor and an inspiration.

The exhibit is to be made upon the soil of Illinois in her great metropolis. It will be surrounded by the evidence of progress and enterprise in every walk of life. Let us see to it that this greatest interest of a free people lacks nothing to make it impressive as well as instructive.

Let every child in the commonwealth be made to feel that he has contributed of his thought and action to the great Exposition.

Additional suggestions and directions will be published if deemed necessary, but it is believed that all further needful information can be given by correspondence or personal visitation.

Additional copies of this circular may be had on application.

Correspondence is invited:

DECEMBER 9, 1892.

WM. JENKINS,

*Supt. Public School Sec. of Educational Exhibit of Illinois.*

Room 18, Montauk Block, Chicago.

HENRY RAAB, *Supt. of Public Instruction of Illinois.*

Rooms of the Illinois Board of World's Fair Commissioners.

Approved:

JOHN P. REYNOLDS,

*Director-in-Chief.*

### Chicago Public School Exhibit.

The Chicago School Exhibit embraces work from the Kindergartens, Primary and Grammar Grades, High and Manual Training Schools and Evening Schools.

The work embraces about 4,000 mounts upon cards 22x28 on wing frames in cases, and 200 wall mounts under glass in frames.

One hundred and twenty-five bound volumes represent the work of whole classes of pupils, and specially selected work, which indicates the methods used in presenting different topics in the various branches of studies.

### INVENTORY.

#### 1—KINDERGARTENS.

Sixty-four mounts representing some portions of the first year's work.

NOTE:—Ten kindergartens were accepted by the Board of Education of Chicago September, 1892.

#### 2—PRIMARY AND GRAMMAR SCHOOLS.

The work of pupils is presented from the first to the eighth grades inclusive:

- a. Language, two cases, 66 cards, with 264 mounts.
- b. Arithmetic, two cases, 66 cards, with 264 mounts.
- c. Geography, one case, 33 cards, with 132 mounts.
- d. History, one case, 33 cards, with 132 mounts.
- e. Physiology, one case, 33 cards, with 132 mounts.
- f. Drawing, all grades, three cases, 99 cards, with 396 mounts, besides 74 cards, wall mounts.

In addition to the exhibits in cases on the various subjects there are framed exhibits of 42 cards with 168 mounts, representing typical work in each grade.

## CLASS WORK IN BOUND VOLUMES.

First Grade 1.

Second Grade, Language 5, Arithmetic 3.

Third Grade, Language 6, Arithmetic 7.

Fourth Grade, Language 5, Arithmetic 6, Geography 7.

Fifth Grade, Language —, Arithmetic —, Geography, —.

Sixth Grade, Language —, Arithmetic —, Geography —, Physiology —.

Seventh Grade, Language —, Arithmetic —, Geography —, Physiology —, History —.

Eighth Grade, Language —, Arithmetic —, History —, Physiology —.

One volume of representative work in each grade and one volume of representative work in each of the subjects of Arithmetic, U. S. History, Geography and Physiology.

## 3—GERMAN.

One volume of class work from each grade from third to eighth grade inclusive. Six framed mounts typical of grade work.

## 4—MANUAL TRAINING.

a. One case representing the experimental work carried on in the grades from two to five inclusive, in the Lake View No. 2 and Foster Schools, 40 pieces.

b. One case representing the experimental work carried on under the patronage of Mr. R. T. Grane in the sixth, seventh and eighth grades at the Tilden School building, corner of Lake and Elizabeth streets, 40 pieces.

Classes from the Tilden, Skinner, Emerson, Washington and Carpenter Schools work two hours each week throughout the year.

c. One set of objects constructed by the pupils of the sixth, seventh and eighth grades from the Jones, Haven, Moseley and Calumet Avenue Schools. The classes re-

ceive their instruction at the Jones School building, corner of Harrison street and Third avenue, two hours a week throughout the year, 18 pieces.

#### SEWING.

One case of 33 cards, having 172 specimens of work from second to fifth grades, inclusive, also three framed typical exercises having 30 specimens, one book of 64 specimens, and another of 37 specimens.

#### 5—HIGH SCHOOLS.

Three cases of 33 cards, with 132 mounts, representing Biology, first year's Science; Physiology, or second year's Science; Chemistry, or third year's Science, besides 40 wall mounts under glass in frames. One biological table with out-fit of microscope and instruments, as used for science instruction, and furnished by the Board of Education of Chicago to the various High Schools.

Fourteen volumes of essays of first, second and third year High School work.

#### EXAMINATION QUESTIONS.

Five volumes showing examination questions, as used in the various High Schools, with a summary of the results.

Thirty-three microscopic preparations in Biology.

#### 6—ENGLISH HIGH AND MANUAL TRAINING.

One case, 60 pieces, representing the various exercises in wood work.

One case, 325 pieces, representing the various exercises in iron work.

One hundred and five articles in wood and iron, showing constructive power of the pupils.

One case, 33 mounts, free-hand drawings.

One case, 33 mounts, mechanical and architectural drawings.

One portrait of Supt. A. G. Lane, and

One of Asst. Supt. A. F. Nightingale.

#### 7—EVENING HIGH SCHOOLS.

One case of mechanical and architectural drawings, having 33 mounts.

Four wall mounts.

Six volumes showing progressive steps in mechanical and architectural drawing, as taught in the Evening High Schools.

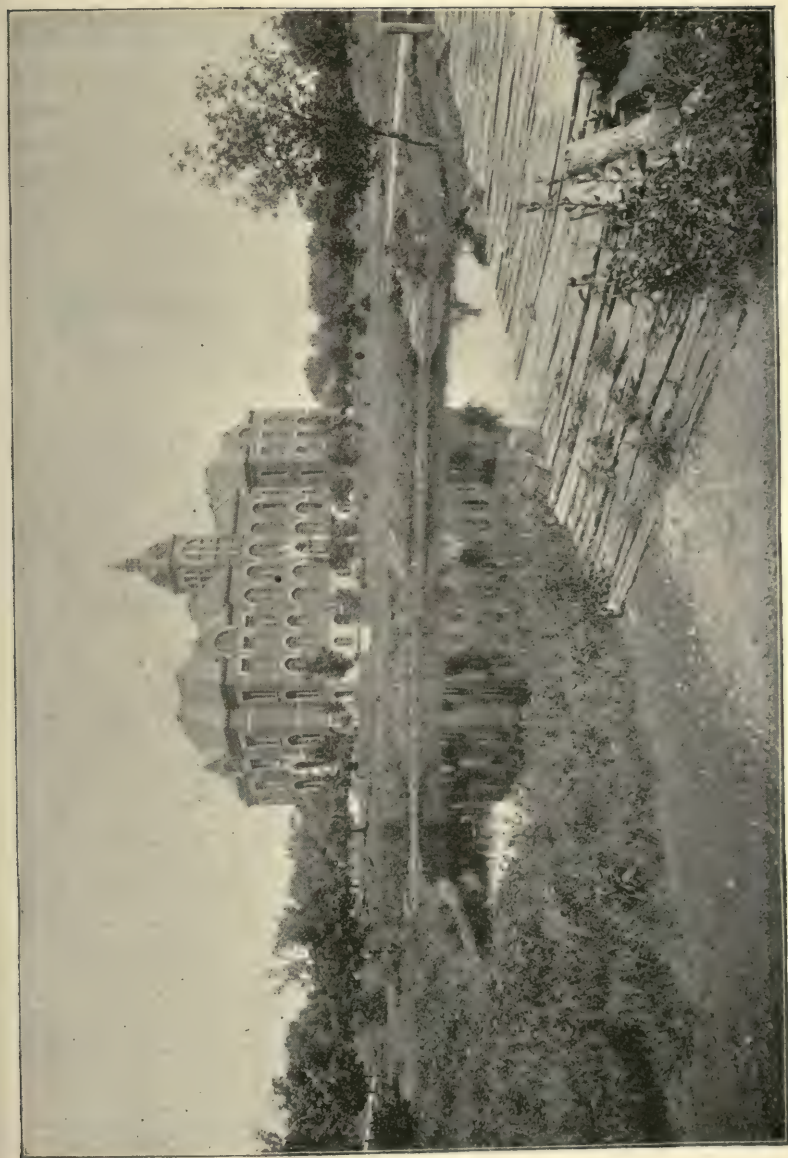
#### 8—TEXT BOOKS USED IN THE PUBLIC SCHOOLS.

One book-case, duplicates of which are furnished to each schoolroom, containing a copy of each text book used in the public schools of Chicago.

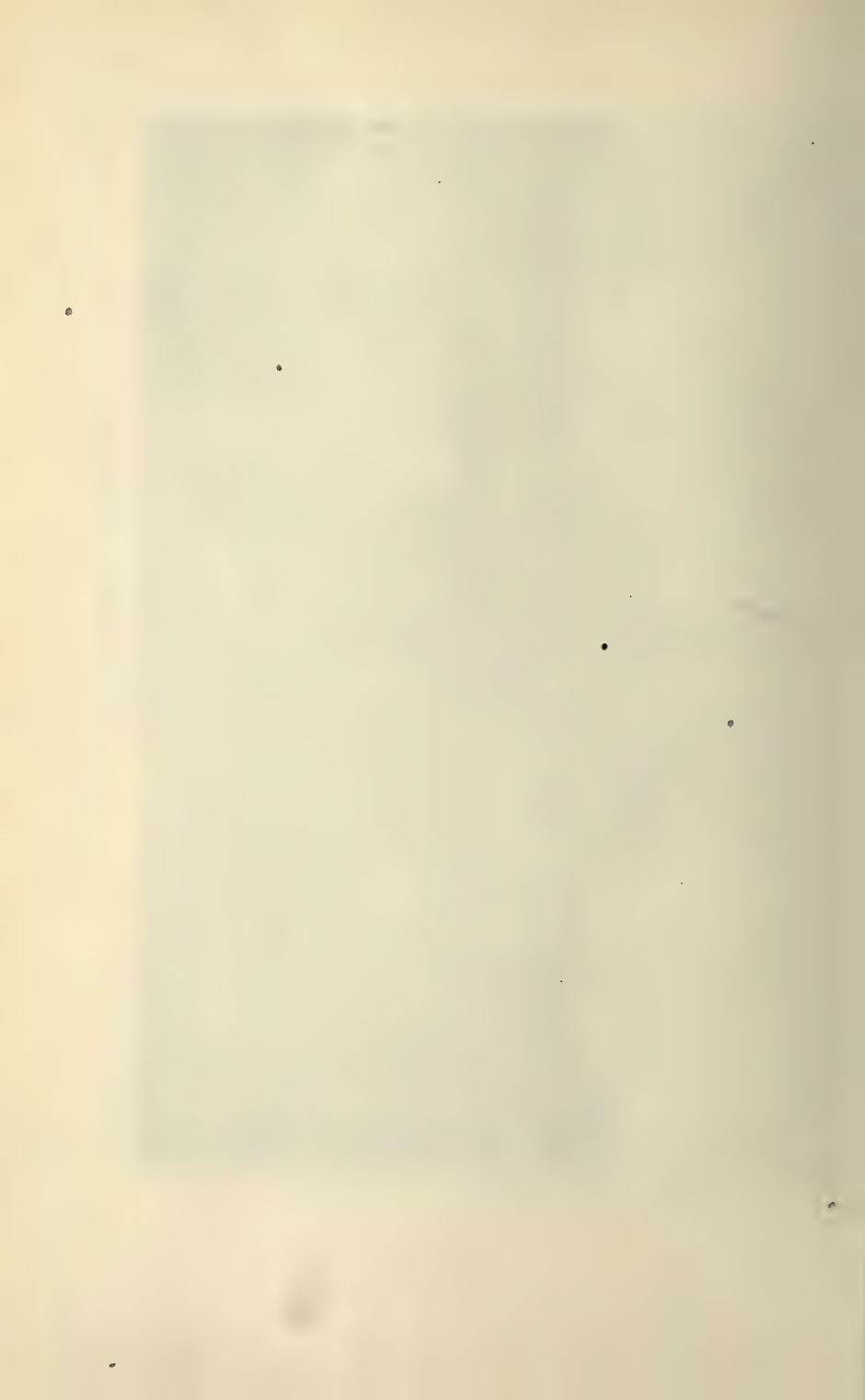
Seven pieces of apparatus made by pupils of the Jefferson High School.

One case of prepared birds of 56 specimens from the Jefferson High School.

One table or bench, such as is used by pupils in the Grammar Grade Manual Training Work.



SOUTHERN NORMAL UNIVERSITY, CARBONDALE.



## **SOUTHERN ILLINOIS STATE NORMAL UNIVERSITY.**

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**(D. B. PARKINSON, SUPERINTENDENT.)**

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**H**EREWITH is respectfully submitted a report of the exhibit made by the Southern Illinois State Normal University at the World's Fair just closed.

Before entering upon the details of the report, it should be stated that the Illinois Commissioners have the hearty thanks of the faculty, the students, and the many friends of the Institution hereby represented, for the desirable and ample space allotted to their exhibit, the excellent provision made for its display, and for the many courtesies shown to those who were in any way connected with its care. Also, for the generous concession made at the close of the Fair in the donation to the institution of the excellent cases, desks, counters, etc., which were provided by the Board in placing the exhibit before the public. It should be further added that these cases, etc., are now in use in the University, and are truly a valuable acquisition to the equipment of the Institution.

The preparation of the exhibit began in the spring term of 1892, and continued through the larger part of the following year, a few pieces being added after the formal opening of the Exposition.

The aim of the exhibit was to place before the world the methods found by experience to be the best adapted to the preparation of teachers for their calling. It should be borne in mind that the character of the work done in a normal school must necessarily differ from that of other institutions of higher learning. The ultimate pro-

ducts of a school of this kind are skill and power acquired in the intellectual training of the young; therefore it was found difficult to fairly present an exhibit that would justly represent the work of the school. After some consultation it was finally decided that the exhibit should consist of the following features: First, photographic views of the buildings and grounds, of the various rooms of the building (in some cases with classes at work), of pieces of apparatus used in instruction; second, the work of the students, in each of the departments, in the form of bound volumes of manuscripts, charts of drawings, manuscripts, etc., mounted on rollers and placed in suitable cases; third, samples of the equipment of appliances for school work, especially that used in the lower grades. The task of care-taking for the six months was given into the hands of present or former students of the school, one serving at a time, each for two weeks, receiving from the Board of Commissioners compensation for their services at the rate of seventy-five dollars per month; to this was added an entrance ticket to the grounds.

Because of the limitations to the task of fairly representing the products of a normal school, it is but just that this report should embody some of the methods of work characteristic of the school and not shown in the preparation of the exhibit. Some of these methods are given more in detail than others. The order of statement as to departments is the same as that adopted in the catalogue of the school, and the account of each department is largely the thought of the teacher in charge of said department at the time of the preparation of the exhibit.

It should be added in this connection that several thousand copies of a unique "Hand-book" were published, setting forth a brief history of the school, its aims, and

its various methods of instruction. This book was considered a part of the school's exhibit and was distributed among the many visitors who were interested in the class of work represented by the Institution.

The exhibit was located on the south side of the east wing between a portion of the space allotted to the University of Illinois and that given to the Illinois Normal University—covering an area of 39x27 feet.

Seventeen excellent cases, made of oak, with glass doors, were provided for holding the charts named above, some of the bound volumes, and the specimens from the natural history department. These cases were placed east and west, facing each other, except those at the ends, with ample space between for the free passage of visitors.

A raised platform, furnished with desk, chairs, etc., occupied the central portion of the floor space. This was used as the office of the attendant, and a sort of headquarters for all friends of the Institution.

Parallel to the platform, on either side, were a counter and show-case for exhibiting the bound volumes and the material used for illustrative purposes in the work of the lower grades.

The cases were arranged in two equal and distinct parts—those on the west for the Normal Department and those on the east for the Training Department.

#### I.—DEPARTMENT OF PSYCHOLOGY AND PEDAGOGY.

The exhibit from this department contained representations of work from each class and showed every phase of the work in the department. The exhibit consisted of students' note books representing work done by the elementary class in preparation for teaching in the ungraded schools; two volumes of reports of observations in the Training School; four volumes of essays and reviews

treating of the principles of psychology and their application to education; two volumes on history of education; and one on ethics. The manuscript of these volumes was so arranged as to present the work systematically in the order in which it was taken up in each class.

#### PSYCHOLOGY.

The manuscripts in psychology were prepared after a thorough study and discussion in class of each subject presented. The plan of work was to take the thought of the author studied as the basis for discussion, and then add to this thought by reading other authors and especially by the student's own experience and investigation. Special effort was made to secure the following results:

1. Independence in thinking.
2. Freedom of discussion.
3. Practical application of the principle studied.

This plan excluded the most valuable feature of the work in this subject from any exhibit that it was possible to make.

#### PEDAGOGY.

The plan of work in pedagogy and history of education was nearly the same as that pursued in psychology. From a careful study of the principles of education a thorough knowledge of theory was obtained. The principles embodied in this theory were then discussed with a view to their application to the daily work of the school. The papers exhibited were either written reviews given as regular class exercises, or results of the study and discussion of subjects considered especially important.

The volumes on "Observations" were made up of reports of those students who were required to spend a portion of the term in observing the work of the practice teachers in the Training School. Each student was

required to visit the same class at least three times, and at the close of these visits prepare a written report of the work studied. These reports were copied without alteration and appeared as originally prepared.

The students' note books represented notes on lectures given the elementary class on subjects specially designed to aid them in teaching in ungraded schools. The notes on each lecture were preceded by an outline which was given the student to follow during the discussion of the subject. At the conclusion of the lecture the notes were written and then copied into the books without correction.

## II.—PHYSICAL AND BIOLOGICAL SCIENCE.

### PHYSICS.

While the "natural sciences" are largely used as a basis in the earlier years in the Training Department of the Institution in furnishing material for the language, number and reading work, the several branches assume more definite shape in the fifth grade.

Pupils are allowed to use an elementary text in connection with their study of physical phenomena. Special attention is given to the inculcation of a correct spirit of inquiry and research, that makes a study a delight and not a burden.

In the eighth grade the pupils are led by advanced steps to see more carefully and deeply into nature's phenomena, and to reason more systematically as they "read nature in the language of experiment." Exercises in observing the reading of graded instruments are begun in this grade, such as noting, daily, the barometric and thermometric readings at a stated time.

In the first term of the second year of the Normal course the students complete the work. At this period

the work is enlarged, a more thorough investigation of many subjects touched upon before, is now required. Problems requiring a knowledge of physical laws are submitted for solution, original essays upon themes studied are required.

The inductive method is emphasized, but not adhered to with that rigidity that precludes the acquisition of knowledge from the results of the labors of those who have been specialists in the various lines of research. The plan has been to combine the best of all good methods.

The work in Physics as outlined above was represented in the Exposition by manuscripts and drawings bound in volumes. The drawings were from the apparatus used, and the manuscripts were either the students' report of the experiment, noting first, the apparatus; second, the manipulation; third, the phenomenon; fourth, the lesson to be learned; or an essay on some subject selected by the student or the teacher.

In addition to the bound volumes, charts were prepared which contained simply drawings and manuscripts describing and explaining the experiment as performed either by the student or by the instructor—showing on a larger scale the method of instruction.

#### CHEMISTRY.

The method of teaching chemistry being largely the same as that of physics, the exhibit was practically of the same general character.

The scheme of note-taking was indicated by the order of description of experiments shown in the volumes and by the charts, which were very similar to those used in presenting the work in physics.

## GEOLOGY.

The nature of the study renders the plan of work somewhat different from that of others in the department. Hence the exhibit was a representation of what the student saw by the study of the text rather than by personal observation. However, as far as the student was able to come in contact with the actual geological formation or phenomena by visiting coal mines, and the adjacent regions, he represented his thought regarding it by a sketch made at the time.

A specimen of the essay work required in this study was also furnished in a bound volume.

## ASTRONOMY.

The plan of work in teaching this science was represented, in part, by bound volumes of sketches and their explanation made from actual observations, either with the naked eye or by the aid of the telescope belonging to the Institution, such as the different phases of the moon and Venus, the relative positions of Jupiter and his moons, Saturn and his rings, the spots on the sun, etc.

## BOTANY.

After giving an analysis of the topics of study in this section, the "Hand Book" gives the following plan of carrying out the work as done in our classes:

"The first two weeks of the term are spent in preparation for analysis of flowers by use of the herbarium, with appropriate lessons from the text book. After this, fresh flowers are placed before the pupils for analysis. As supplementary to the text book work each one is expected to write out the analysis of at least twenty-five flowers in a copy of Keep's Plant Record Book, with drawings of leaf and flower, besides making drawings of seeds, buds, fruits, etc., with appropriate descriptions."

The exhibit showed this work in the following way: One book, marked "A Botany," gave samples of tests taken from time to time during the term, with samples also of a paper required of each one on "How to Teach Botany." A second book gave the manner of use of Keep's Plant Record Book by exhibiting the work done by five pupils of the class, their books being bound together in one book after they had completed the required work of the term. In binding these the original covers were removed by the binder, and by an oversight the names of the pupils doing the work, being on the outside of the original covers, do not appear in the bound volume. The books taken were fair samples of what was done by a class of nearly a hundred pupils.

While the study is continued for only one term and without previous preparation being required by having studied elementary botany, the text book covering the elements of structural and physiological botany and some familiarity with plants are all that could be required. But while that is the case, other and more advanced work, by those competent to do it, is always encouraged. As an illustration of the character of such advanced work, one of the pupils of the class whose work was on exhibition at the Columbian Exposition took up the study of ferns as a special study. She did as a part of her study the following work: Study the ferns in their homes, make collections, study the spores and microscopic structure of the plants. As part of her work, she made a set of drawings of the ferns of Jackson county, Ill., one plate or drawing for each species, except one, of all of those that are known to occur in the county, the single exception being *Asplenium Ebenoides*, that having been found once only in the county. The twenty-four plates of drawings she made showed first the whole plant, or a frond natural size or reduced, second

a section of this enlarged so as to show the position and character of the sporangia, third a spore case and one or more spores as seen by the compound microscope. These drawings, accompanied by notes on habits and habitat, formed the third book of the exhibit.

#### ZOÖLOGY.

The first paragraph of the explanation under zoölogy in the "Hand Book" contains an analysis of the topic of the text book used in the subject. The second paragraph contains a brief synopsis of the method of treating this study in classes.

The exhibit in this branch consisted of two parts, a book and a sample case of specimens from the museum, used in illustrating the subject. The book, after the preface stating the aims and methods in this science, contained samples of the written tests taken during the term. Part of these were in the form of essays on the topics after they had been studied in class.

The sample case from the museum consisted of a case of ducks, and was labeled "Ducks of Illinois," containing twenty-one species, nearly all the species that have been known to have been found in the State. Birds are used in the classes both for illustration of the subject of birds in general and for more detailed study. What is true of birds is true of other groups of animals, and hence we could appropriately use such a case as a representative of what we use in illustration in the classes in zoölogy.

#### PHYSIOLOGY.

The "Hand Book" of the work of this school has the following brief digest of the topics studied in this work during the single term that is devoted to the study of physiology:

"Skeleton; terms of the science defined; tissues; skin and the part pertaining to it; food; digestion, including organs and fluids; absorption, lymphatics; respiration, circulation, heart and accessories, blood excretion. Nervous system; brain, nerves, sympathetic system; special senses; vocal organs. Motatory organs in detail."

The next paragraph referred to manner of pursuing the subject mentioning the use of the skeleton charts, microscopes and speaking of a regular course of dissection in connection with the subject.

The book on "A Physiology" gives a preface stating the aim pursued in teaching the subject, the kind of materials we have to deal with in the way of students, and the manner of presenting the subject in detail. This is followed by a set of the directions for dissecting, together with one set of the notes that were taken at one of the tables while dissecting; both the dissection and the directions copied by one of the pupils of the class. The instructions and notes on dissection occupied thirty-four pages of the book. The remaining portion of the book was devoted to copies of the written tests taken through the term, enough of each being given to show the character of this work, and as different pupils were asked to copy their work at the different times, these tests were taken. The work shows the difference in style of work of the different members of the class. After studying the parts relating to the eye and the ear, the pupils were asked to write essays on these two subjects. Copies of these appear in connection with the tests.

### III.—MATHEMATICS.

#### ARITHMETIC.

The exhibit in this department was intended to illustrate the methods of instruction in the more advanced work, as the exhibit shown by the Training Department sufficiently set forth the manner of presenting the sub-

ject to pupils in the first eight years of their school life. The central thought in all the work was thoroughness and rapidity, and a comprehensive knowledge of underlying principles.

#### ALGEBRA.

The method adopted in preparing material from classes in algebra was quite similar to that used in the geometry. Since the work continued through the entire year a less per cent. of the papers was selected.

The statement made regarding the selection of the papers in the exhibit from the geometry classes should be made regarding the algebra classes.

#### GEOMETRY.

The exhibit consisted of the best three-fourths of all examination papers made by the class in the course—two terms.

These papers were in no sense special efforts, but were simply fair samples of the regular monthly examination work of the classes. A few dozen of these papers were arranged in chart form, similar to those of other departments. The other papers were bound in volumes of the regulation size and style.

#### BOOK-KEEPING.

The book-keeping exhibit consisted of book and chart work. The bound volumes consisted of sets of books prepared by the pupils in their regular class work. The charts presented various business papers and forms required to be prepared by the students completing the course in book-keeping.

The plan was simply to show the regular work required of a pupil while pursuing the study.

## IV.—ENGLISH LANGUAGE AND LITERATURE.

## READING.

The written work in reading presented in Vols. A and B was intended to represent examination work, illustrating in but a partial way, the manner of instruction in this pleasing and highly profitable study.

It indicated the teaching to be in accord with a simple law of classification of ideas—grouping ideas into classes; Matter of Fact, Earnest, Noble, Joyous, Sad, Sarcastic, Humorous, Impassioned, etc., studying their import and characteristics, discovering the elements,—form, quality, force, stress, pitch, and rate, necessary for the rendition of each class, and then reading the selection with expression as the result of a proper knowledge and culture regarding these elements.

The object of the instruction is to secure the proper elocution of reading, not an elocution of the platform.

The system used is that of Mark Bailey of Yale College.

The scheme used to accomplish the work is original with the teacher of this department.

## GRAMMAR.

The exhibit in this branch was intended to show the extent of the work for each term, and to indicate the methods by which it is accomplished.

Four terms in the Normal School course have grammar as one of the required studies. Language lessons and the primary work in grammar belong to the Training Department and constitute a part of that exhibit.

In conducting the Normal classes, the aim is two-fold—first, to see that these coming teachers have a thorough mastery of the topics studied; second, that they know how to impart that knowledge to others. To accomplish the second aim, one day in each week is free from

any assigned lesson, and the class is resolved into a Teachers' Institute. The members have the time for questions upon any points not understood, or upon how to teach any topic. As the majority have had some experience in teaching, these exercises are among the most profitable, but could not well be shown in the exhibit.

The first term is given to the simple sentence in all its varieties with its proper capitalization and punctuation. As the elements are studied, the parts of speech of which they are composed are reviewed with their properties and inflections. The value of each principle as a guide to correct English is tested as it is applied in answering the questions asked by the class. The changes in form occasioned by a change in the relations of a word to the other parts of a sentence were illustrated by a chart scheme showing the essential points in English etymology. A volume of regular class papers accompanied the chart.

The second term's study is given to complex and compound sentences. In this term abridgement is treated and its grammatical changes noted, with the principles which underlie them. Essays are required each month upon topics assigned. The chart and book sent from this class was a complete illustration of all correct forms in abridged expressions, with a statement of the principles governing the choice.

Eight weeks are given to a special study of methods. This class begins with the first language lesson work and takes up grade by grade through the grammar to the close of the Normal School course. What is suitable to each grade, and how to adapt the teaching to the capacity of the pupils, are the central points for consideration. Thus a complete review of both language and grammar is incidentally obtained. From this class were shown model lessons suited to each grade.

## ENGLISH ANALYSIS.

In addition to the work indicated above, a term is used for English analysis. The difficult points in grammar are studied. Entire compositions are analyzed logically, the line of thought discerned and the logical sequence of paragraphs of sentences perceived. The principles of rhetoric are applied in rhetorical analysis, and the principles of grammar in a grammatical analysis of the same composition. In this class, essays and orations are required. The exhibit consisted of different selections copied and analyzed logically, rhetorically and grammatically.

## RHETORIC.

The work presented in rhetoric was designed to exhibit the methods of culture in purity, propriety and precision of diction; in concord, clearness, unity, energy and harmony of the sentence; in impressing upon the mind and heart of the student the beauty of the style in writings of the best authors, as controlled by the use of figurative language; in cultivating delicacy and correctness of taste, and in reaching a high ideal of the beautiful and the sublime, the novel and the picturesque as these properties of style and taste find their parallels in nature. *Method.*—The work in this branch is largely illustrative, both orally and in use of the blackboard, using daily class drill and written exercises.

## ENGLISH LITERATURE.

We may say that the exhibit relating to this work in this department, was intended to present the methods adopted to arouse students of this branch of education to a study of our best writers in literature, both English and American.

### Methods:

1. By means of biography.
2. By close analysis of the thought.
3. By pointing the student to the author's nationality, customs and manner of life, and paralleling his work with these environments.
4. By developing the parallel growth of the literature of a people with the political status, thus showing to the student, in an attractive way, the origin of much of our best literature.
5. By selecting some drama, or other work of an author, as a play from Shakespeare, or the best selection from Longfellow, etc., and having studied it faithfully, as above indicated, write out a close, a severe criticism.
6. By comparing the best of American and English authors, noting their manner of living, social and political standing, and quality of work.

### ELOCUTION.

The work in elocution secures for the students:

1. A study of the best productions of our best orators, on the basis of form, quality, force, stress, pitch and rate of utterance.
2. A practical class-drill, daily, in the mechanical demonstration of eloquence—the very soul of expression—by means of general gesture.

In all this work the teacher's example guides, naturalness is secured, and the spiritual rather than the mechanical means come to the front.

## V.—GEOGRAPHY AND HISTORY.

## GEOGRAPHY.

The aim of the work displayed was to illustrate (as far as possible by means of maps) the successive steps taken in each class.

The time given to the study of geography in the Normal Department is three terms. The classification is made under three heads, viz.: B Geography, A Geography and Physical Geography.

The B division of this department represents the work of the first term. The topics taken up in the beginning are embraced under the head of mathematical geography. Out of the wide range of topics comprehended under this head, a few were selected, as having the most bearing on the main subject, the work on the charts showing the order in which they were taken.

A knowledge of the influence of the sun upon the earth and the relations of the two, is the direct practical purpose of teaching in this stage of the course. This implies a good knowledge of the distribution of heat and moisture, and of the modifications brought about by the different degrees of atmospheric pressure. These are the essential factors in the study of climate. Climate determines the use of the structure, and the structure in a marked degree modifies climate. Both seem to be the two halves of a great whole which nourish and support life, plant and animal, and at the same time determine the forms and modes of life.

The second step is in relation to continents, in respect to their physical features.

A knowledge of structure being the indispensable foundation of all geographical knowledge, without this knowledge, geography, as a science, is impossible. One important purpose in learning structural geography is

the acquisition of a concept which corresponds to the surface structure of the earth.

A concept of the earth with all the factors of structural geography organically arranged and related, is the basis of political geography. With a clear concept corresponding to the continent political geography becomes, to the interested pupil, the division of real, mentally pictured surface into its artificial regions. The element of history in geography is not neglected. Geography is not neglected. Geography explains and illuminates history; by it, laws, tendencies, and motives are understood.

As one whole plan could not be shown on charts, several volumes accompanied these. These books contained essays, written by the members of the class, on topics assigned as regular class work,—these papers taking the place of the usual examination work.

The second term's work, A division, is a continuation of the work as carried on in B, except more time is given to the discussion of methods. (To understand a method, a teacher must know the laws of mental development, and the means of the development.)

As far as possible the successive steps represented in an accepted course of study are discussed.

On the charts devoted to this division, the plan of work as carried on by pupil teachers in the Training Department (under the supervision of the teacher of geography) was fully shown. Beginning with color and form, then taking up the school room, school building and surroundings, then "home geography," and so on through the work laid out for the seven grades.

The study of physical geography proper covers the work of the third term. The aim is to discuss the more familiar physical features of the earth; the character of its land surface, the nature and movements of the water,

and of the atmosphere, and their relation to and influence upon one another, as well as their combined effect upon the different forms of organic life.

The work of the pupils in this class was illustrated on charts, taking up the work as presented in the text book (Guyot's). Maps of all the grand divisions were prepared. Our aim was to have a map of each division as follows: Physical map; map showing the characteristic trees and plants; maps showing principal minerals; drainage map; ethnological map.

#### HISTORY.

The World's Fair exhibit from this department consisted of bound volumes, charts and photographs.

The books were made up of papers upon various subjects studied by the class, and of examination papers, presented as written, unaltered further than by the checking of errors.

The charts were designed to illustrate the progress of the United States, by maps showing the increase of population and area; the wars, foreign and civil, in which the United States has engaged; by drawings showing the changes in the flag of the United States, etc. Similar charts were prepared to accompany the history of other countries.

The photographs are copies of work put upon the board by the pupils in connection with daily recitations.

#### VI.—PENMANSHIP AND DRAWING.

##### PENMANSHIP.

The penmanship display from the Normal Department embraced charts and books. The material for both was prepared by pupils during the recitation hour. One paper a week was taken from each student in class.

The design was to show the rate of improvement from week to week, and also the character of exercise used for practice,

There was work upon movement exercises, single letters, single sentences, simple business forms, and letter writing.

#### DRAWING.

In the exhibit from the Drawing Department, the aim was to show the plan of work, as follows, through the three terms, or forty-two weeks required by the course:

As to its purpose, the drawing work is divided into construction, representation and decoration. The work on the charts showed the order of study in each division.

Since so many enter the school without any knowledge of drawing, the work of the first term is necessarily preparatory. It is entirely free-hand and largely from blocks and other simple objects. The chart for this term showed the beginning of the work, views of single blocks, commencing with sphere and cube, the making of patterns and working drawings of objects.

In representation there were drawings from solids, cylindrical and rectangular in form, and simple groups of two and three objects.

In decoration there were shown the modification of units, forms cut from paper and combined in pleasing arrangements. There were also drawings from natural leaves, which were afterwards conventionalized and used in design.

A book was exhibited showing dictation exercises, written by the pupils, from forms which had been given to them for blackboard exercises.

The second term's work was represented by instrumental drawings and by working drawings of objects found in the school room, as the door, table and teacher's desk.

Drawings of groups of familiar objects and of plants were shown. There were examples illustrating some of the characteristics of the ancient styles of ornament, as the Egyptian and Roman. There was a chart of designs for special subjects, among which were found those for book covers, lace, holiday cards and borders of various kinds.

During the third term, light and shade is studied, beginning with the cube and cylinder, then taking groups of two and three objects and casts. Examples of this work were shown in the exhibit.

Considerable attention is paid during this term to blackboard work, the drawing being largely illustrative. The object is to enable those who are to teach to use the blackboard in the school room with ease and rapidity.

Two weeks' time is devoted to methods, which includes the reason for the study of drawing, a review of the plan of work, and methods for teaching in the different grades. A volume of essays on "Drawing in the Public Schools," written by members of the class, formed part of the exhibit, as did also a book of sample drawing lessons written for the different grades by the pupil teachers in the Training Department.

## VII.—VOCAL MUSIC AND PHYSICAL TRAINING.

### VOCAL MUSIC.

In vocal music, one of the fine arts, the instruction is necessarily limited by virtue of the Institution being one for the training of teachers for efficient work in our common schools, not in the special branch of music, but in the several branches of a common education.

The endeavor is constantly to secure the following:

1. The simple knowledge of the elements of music.
2. The ready reading of music at sight.

3. The simple and easy transposition of the scale from one key to another.

4. The proper methods of breathing and vocal culture,

*Remark.*—The above are the means used to accomplish practical results from the branches taught in this department of the Southern Illinois Normal University.

In this way only can we feel that the State gets value received for her outlay, in supporting the school.

#### PHYSICAL TRAINING.

The exhibit of this department consisted of the course of work as outlined in the catalogue and "Hand-book," and photographs of classes at gymnastic exercises.

The aims of this course are:

First, the personal health and developement of the students.

Second, their equipment with a system of school gymnastics.

Both these ends are, to a considerable extent, gained by the same course of training. The students are first drilled in simple graded exercises which may be used in any school; the system is learned first as free movement, then with light apparatus—dumb-bells, Indian clubs, and wands. Further variety and interest are gained and strength and dexterity developed by heavy gymnastics in the gymnasium and by athletic sport.

Parallel with the course in practice, is a series of lectures on the history and systems of gymnastics and on hygiene, especially that of the school room and of students' life.

## VIII.—LATIN AND GREEK.

## LATIN.

The exhibit from this department consisted of charts, bound volumes and photographic views.

The charts illustrated the work of each year in the Latin course, showing a gradual advance from the simple forms of declension and conjugation, to combinations involving the principles of analysis and syntax. Maps of the battle fields of Cæsar's campaigns, plans of his camp, and models of his famous bridge across the Rhine, followed by exercises in scanning and translations from different Latin authors further illustrated the purpose of the work of this department.

The bound volumes carried out in more minute detail the work suggested by the charts, copies of written exercises, tests, maps, essays on important subjects in syntax and prosody, reviews of the different books of the *Æneid*, and more extended translations gave a general view of the work of this department.

The photographs were views of work placed upon the blackboard of the class-room, by pupils, and used in daily recitations.

## GREEK.

In Greek the display was smaller, but followed the same general plan.

## IX.—GERMAN.

This department was represented in the exhibit of the school by a set of monthly examination papers of a class that had studied German six months. This was the only class studying German, the language having just been introduced again after an absence of several years.

Written work can show only partially and imperfectly the results of the study of language. Our aim above all is fluent and idiomatic translation at sight; subordinate aims are the understanding of spoken language and speaking it, and finally writing, reading for fullness, hearing and speaking for readiness, writing for exactness.

Whatever else is lacking, our work is not in vain if only the students read enough to bring them to that point where they will continue to read for the very pleasure.

In the papers exhibited, the work was set as follows:

1st. Write some verse of German poetry and its translation into English.

2d. Write one of the model sentences and its English translation.

3d. Some sentences from a rather familiar German story were dictated to be written and translated.

4th. A few *ex tempore* sentences were spoken to the class and the translation into German was written.

#### X.—TRAINING DEPARTMENT.

The exhibit made by the Training Department of the Southern Illinois State Normal University was in three divisions, namely: (1) charts containing manuscript papers prepared by pupils; (2) bound volumes of manuscript papers prepared by the pupils; (3) materials for illustrating the work in classes.

The aim of the exhibit was to give samples of what children of the several grades can do. There was an effort, also, to show the relation of the work in any branch and grade to the work in that same branch in the preceding grade. It was also desirable to show the use that may be made of each study in the pursuit of any other study.

In both the chart-work and the bound volumes the work was arranged by months, terms and years; so that with little effort of visitors the entire course in any branch could be seen.

The methods of preparing the exhibit varied somewhat in the different branches of study. In general, the practice teachers were asked to present a sample page of work done by the pupils, at the end of each month. This work was in many instances the first effort of the child to produce that particular exercise. In other words the work was "original." In other instances, as in essay writing and science work, the pupil's first paper was criticized by the practice teacher or supervisor, and the pupil asked to try again. Examinations were held three times each term, and the papers handed in by the pupils were often taken to represent that month's work. The entire work was done by the pupils under practice teachers, except a portion of the work shown by the seventh and eighth grades.

The corrections of all papers were made in red ink. Each paper, shown in the exhibit, when handed in by the pupil, was corrected in spelling, form and punctuation.

The arrangement of the exhibit was attractive. The Training Department was given the east half of the space allotted to the Southern Illinois State Normal University. This space was rectangular. Around the outer edge of the east half the Training Department exhibit was placed. Elegant oak cases with glass doors were provided. In these the charts were hung so as to admit an easy inspection. The bound volumes were placed upon tables for inspection. The materials used in class work and gathered by pupils, practice teachers and instructors were shown in show cases near the center of the floor space. These materials included measures, weights,

forms, patterns, etc. Many articles gathered by pupils and teachers in the science work were shown, also charts in reading, number, language and music, made by practice teachers. Photographs of classes at work in nearly every study and in nearly every grade were shown.

A fuller description of the exhibit from the Training Department and the manner of preparing the work is given below.

*Reading.*—In learning to read, two objects are kept in view: (1) Inducing thought. (2) Conquering mechanical difficulties, the thought preceding the oral expression. To this end the words are mastered before the sentences are read. Spelling is supplementary to reading, and is taught through the eye and hand; by seeing and writing.

The papers shown by the first grade were selected from the regular class work, following the above outlines, and was done under the immediate direction of the practice teachers.

The distinctive work of the second grade consists in (1) sighting words, and (2) writing from dictation. Facts to be learned about a word—(1) letters needed for writing the word, (2) their sounds, (3) syllables, (4) the accent. Papers were shown in which children of the age of seven and eight years wrote, syllabicated, accented, and diacritically marked, thirty two-syllable words in thirty minutes. Simple poems and stories were read by the children, and reproduced with simple illustrations.

The papers from the third grade (two divisions) showed dictation exercises in spelling, copied selections and reproductions. Those from the fourth grade showed word studies, homonyms, defining, sentence-making and reproductions of poems and illustrations.

In the fifth grade the papers showed sentence-making, using the new and difficult words of the lesson. The

work of the next three grades took on more the form of literary study. Some of the selections studied were Ruskin's "King of the Golden River," Irving's "Sleepy Hollow," "Hiawatha," and complete selections from Bryant, Whittier, Hawthorne, etc. Papers showing all the above work were shown.

*Language and Grammar.*—The work of the first and second grades showed reproductions and memory poems. These poems were given by the teachers, and the thought and form carefully noted. Use was also made of the science study as a language exercise. The work had two objects, (1) to secure habits of correct speaking and writing, (2) to develop and to cultivate a taste for the best in literature. "The Village Blacksmith," Æsop's "Fables" and other similar material was the foundation for work in the third grade. The fourth, fifth, sixth and seventh grades showed work in reproduction, essay writing, abbreviations, descriptions, homonyms, quotations, letters, punctuation, and the study of changes in form of words to correspond to changes in use.

*Writing.*—Writing runs through the first seven years of the course. In the lower grades it is a means rather than an end. The instruction and practice aimed to secure accuracy of form, ease and rapidity of execution.

The work shown was done under practice teachers and represented every month of the year. Business and social forms received attention throughout the several grades.

*Drawing.*—This study is helpful in developing the child's perceptive faculties. The type forms are sphere, cube and cylinder. The pupil models these. The circle, square and oblong are developed from the type forms. Stick-laying and color-work are a part of the first year's work. The types of the second and third grades are hemisphere, square prism, triangular prism, semicircle,

equilateral and isosceles triangles, ellipsoid, ovoid, cone and pyramid. These are studied, drawn and modeled.

In the following four grades text books (blanks) are used, and the work is carried on under the three heads—Construction, Representation and Decoration. Work under these three heads for each month was shown, also sketching and work from nature.

*History.*—History is formally begun in the sixth grade. A primary text is used. The work shown consisted of biographies, illustrations copied from books, and stories written when the topics were finished. Attention was also called to the historical selections found in the reading lessons.

In the eighth grade a regular text was taken up. The work shown included maps, biographies, outlines, abstracts, essays, and drawings of forests, implements, clothing, and other objects peculiar to the various stages of the country's history. A very careful study of the Constitution was made near the end of the year's work. An outline of the departments of government was shown.

*Music.*—Music is taught in the lower grades. The work shown representing this branch of study consisted mainly of photographs of classes and charts made by practice teachers.

*Numbers and Arithmetic.*—The work shown in first grade numbers represented the child's power to interpret and represent numbers below ten. Objects were used to introduce the child to the method of thinking in numbers. Papers by the children were shown representing the work of each month of the year. Also a chart made by the practice teacher. The papers shown from the second grade showed work on numbers below twenty-one. Those from the third grade showed operations on tens as wholes. Some of the simpler written forms were shown.

The fourth grade papers showed methods of approaching "fraction," both common and decimal. The fifth grade work exhibited methods of procedure with the "properties of numbers." The sixth grade work was on the subject of "compound numbers." These papers showed many illustrations by practice teachers. These were photographed and shown in an album.

The work of the seventh and eighth grades covered the subjects usually found in "practical arithmetic," namely, fractions, tables, percentage and its kindred subjects.

*Geography.*—This study is introduced into the third grade by developing the ideas of color, form, distance, direction, and by requiring plans of the room and yard. The work exhibited showed this work. In the fourth and fifth grades an elementary text is used. The work of these grades showed essays, drawings, maps and descriptions of some simple experiments relating to movements of air. People, places, and things in foreign lands formed subjects of much interesting study.

In the seventh grade a complete grammar school geography is completed. The work shown by this grade consisted of maps, essays and drawings representing every month of the year's work. Attention was also called to the historical incidents connected with the several places studied.

*Field Work and Science.*—Work from the first six grades was shown in a bound volume and named "Field Work". It contained drawings and descriptions of such material objects as the children came in contact with in their hours of recreation.

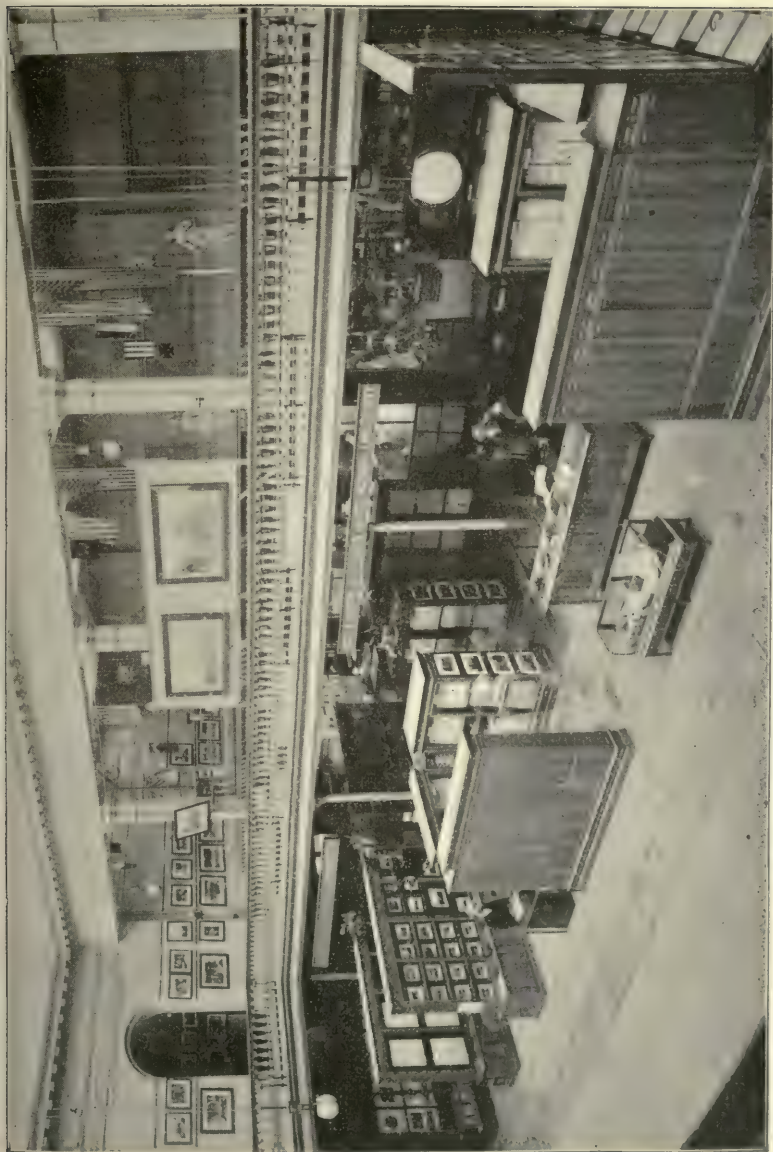
Nearly all this work was collected during the spring term of 1893. Some of the things studied were leaves, seeds, roots, buds, insects, flowers and birds. The pupils made free use of water colors and made very neat representations of the objects studied. Quite a good deal

of the material gathered was shown in a collection of "material aids" from the Training Department.

In the sixth, seventh and eighth grades science work was taken up more formally. The work shown represented a term each on botany, zoölogy, physics and physiology. Each study was represented by a bound volume of manuscripts and a chart of drawings, etc.

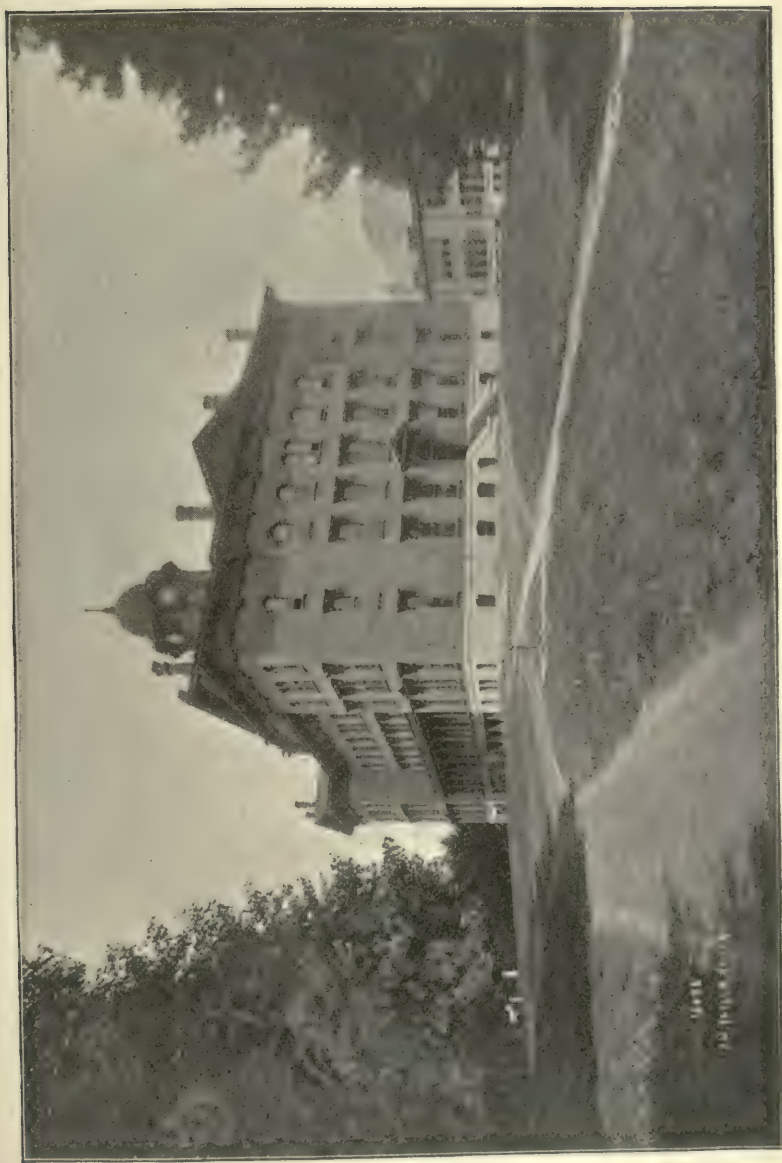
*Physical Culture.*—Photographs showing the several grades of the Training Department in their daily work in this study were shown.





STATE NORMAL UNIVERSITY, NORMAL.  
SOUTHERN NORMAL UNIVERSITY, CARBONDALE.





STATE NORMAL UNIVERSITY, NORMAL, ILLINOIS.



## ILLINOIS STATE NORMAL UNIVERSITY.

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JOHN W. COOK, PRESIDENT.

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**I** PRESENT herewith a report of the exhibit made by the Illinois State Normal University at the World's Fair.

Permit me to express, in behalf of the Board of Education of the State of Illinois and of the faculty and students of this Institution, our sincere thanks for the distinguished consideration shown us in granting us ample space for our exhibit, for the generous gift of suitable cases for its accommodation, and for numberless courtesies received during the progress of the exhibition.

Through your kindness we were permitted to remove to the Institution such of the cases as we desired. We have been able to make very profitable use of them in exhibiting various illustrations of our work, and in indicating to the children some of the many phases by which raw material is converted into useful fabrics.

Early in the year 1892 we were informed that we should be offered an opportunity to make an exhibit of the work of this Institution in the building to be erected by the World's Fair Commissioners of the State of Illinois. Shortly after this notification the work of the preparation of the exhibit was begun.

It is extremely difficult to so set forth the work of an educational institution, by means of objective exhibits, as to indicate with any degree of accuracy its spirit and scope. The theory of an institution may be reduced to propositions and thus made apparent to every intelli-

gence that is capable of understanding such a statement. But the every-day work of an institution of this character, the spirit which pervades teacher and pupil, the details of method, the skill of the instructors, the general atmosphere of the institution,—all of these must of necessity, to some degree at least, elude the most painstaking care of one who should attempt to describe them.

Recognizing the difficulties involved in such an undertaking, it was thought advisable to indicate, in as striking a way as possible, and in a manner that could be readily grasped, some of the most salient features of the school and of its work, and to leave it to a discriminating public to supply the remainder. In the following description of this exhibit I shall substantially traverse the course of study and practice, and shall endeavor to show what was done.

#### ILLINOIS STATE NORMAL UNIVERSITY.

It should be said in the beginning that this Institution is in no sense a university. It was so called to meet what was deemed a technical necessity in order that the Institution might avail itself of certain congressional grants. Established in 1857, the first three years of its existence were spent in rented quarters in the city of Bloomington. In 1860 it occupied the present main building which was its exclusive home until the addition, about three years ago, of the Training School building.

#### THE BUILDINGS.

The main building is 100x150 feet, three stories high above the basement. On the first floor are the library, dressing rooms for the ladies, president's office, a large recitation room for the drawing classes, and the high school with its two recitation rooms. On the second floor is the large assembly room for the use of the Normal Department. It is 64x74 feet inside and 18 feet high.

Grouped about it are eight recitation rooms. On the third floor are the physical and biological laboratory, a large hall used for general convocation, and the rooms of the two leading literary societies. In the basement are dressing rooms for gentlemen, the chemical laboratory, a room used for gymnastic exercises, and several store rooms.

The Training School building is a two-story structure, 86x96 feet, and arranged as hereinafter described.

The boiler-house is a one-story structure containing a coal-room and boiler-room. In the boiler-room are three boilers that furnish the steam for the heating of the school buildings. These buildings are situated near the northern end of a campus of fifty-six acres, which is abundantly supplied with evergreen and deciduous trees. But little has been done in the way of ornamentation beyond the planting of trees, but the enclosure is exquisitely beautiful when robed in its garments of green.

The Institution consists of three departments: The Normal Department, the High School Department, and the Training Department. The Normal Department expresses the central aim of the Institution. As the name implies, it was established for the single purpose of preparing teachers for the common schools of Illinois. The other two departments owe their existence to the fact that they are instrumental in carrying out this aim.

When this Institution was established there were but few normal schools in America. Germany had been somewhat active in the organization of teachers' seminaries, but the modern movement, so significantly illustrated in England, France, Canada, Japan, the Argentine Republic and the States of the American Union, belonged to the future. There was a feeling that the Normal School would be sadly incomplete without the accompaniment of a school of children. It was held that this school should

display all of the grades of our public school system. Pursuant to this idea a Primary Department was established shortly after the organization of the Institution. From this modest beginning a Model School, representing all the grades from the primary through a four years' High School course, was finally developed.

In the course of time the High School became a school of observation and an auxiliary in the work of instruction, and the grades below it became a practice school in which the Normal pupils serve an apprenticeship in actual teaching under the eyes of skilled critics.

As will be seen later, the Normal School curriculum includes only the English branches in the regular three years' course. Many pupils, however, desire instruction in the classic and in the modern languages. Such instruction is given by the principal of the High School and his assistants. A further fact of interest should be stated. The Model School began as a tuition school, and it has so continued in all of the rooms above the Primary. It is not only self-supporting but furnishes a considerable revenue to the Institution.

All candidates for admission to the Normal Department must be not less than sixteen years of age, if females, nor less than seventeen if males. They are required to sign the following pledge: "I hereby solemnly declare that my purpose in attending the Normal University is to fit myself for teaching in the schools of Illinois, and that I will carry out this pledge in good faith; and I do further pledge myself to report to the president of the University, semi-annually, where I am and what I am doing, for three years after graduating at said Institution."

Since the pupils have a common aim there can be no excuse for introducing any work that does not bear

directly upon the accomplishment of the one supreme purpose that called the school into existence.

In attempting to realize this purpose three lines of work are developed:

1. The subjects of the school curriculum are re-examined *reflectively*. What is meant by this statement may be illustrated by the treatment of any particular subject, as geography. The immediate purpose of this study is to enable the pupil to think the world as it really is. He must be equipped, therefore, with a body of ideas by means of which he can construct out of ordinary description a world that he may never see, but which he is to know almost or quite as accurately as if it had been an object of direct perception.

This necessitates a careful analysis of the whole subject in order that these fundamental ideas may be discovered, and that a mental experience may be secured, without which geographical explanations and descriptions would be substantially meaningless.

This is sometimes called "academic" work and, consequently, is declared to be out of place in a Normal School. It would seem that but little reflection would be needed to discover that work of this character is indispensable to a Teachers' Training School, and that it is radically different from the ordinary treatment of the subject. It contains, manifestly, a super-added professional feature which sharply differentiates it from what is understood by academic work.

2. A second line of work is purely professional. It consists of a study of the history of education, of the development of general and special method, of an examination of the science of psychology as a basis of methodology, and of the philosophy of education for a general view of the problem and for a suitable adjustment of its elements.

3. The third feature is practice work in the Training School. Each candidate for graduation is required to teach a class of children one hour each day for a period of about fifty weeks. This work is carried on under the guidance of critic teachers who supervise it with great care.

It is clear that the problem set before us was the displaying of these phases of our work in such an objective way that by looking at pictures, models, drawings, examination papers, outlines of work, etc., an observer could come to conclusions that should be fairly accurate respecting the aims and activities of the school.

#### THE LOCATION OF THE EXHIBIT.

The exhibit was very favorably located at the east end of the Illinois Building, immediately adjacent to the center aisle and opposite the admirable Public School Exhibit. It occupied an area of 27x40 feet. It was displayed in a series of eight double cases. They were constructed with a view to the largest possible wall space rather than to the production of any æsthetic effect. They were arranged on opposite sides of four cross aisles which permitted the freest access and exit. The exhibit stood between the Women's Exhibit and the main aisle, and as the cross aisles were fairly commodious they became thoroughfares through which an immense number of people were passing almost constantly. At least a casual glance was bestowed upon the contents of these cases by the average visitor who found himself in this part of the Illinois Building.

#### THE NATURAL SCIENCE EXHIBIT.

This exhibit occupied the cases on the opposite sides of the east aisle. The methods of work in zoölogy, physiology, botany, physics and chemistry were here illustrated.

It is needless to say that the exclusive text book method of instruction has long since disappeared from all schools that lay any just claims to modern methods. It is a principle as old as Comenius, and, indeed, as old as the race that in the earlier stages of education the direct perception of objects is necessary to a knowledge of them. The laboratory method has become the method of Natural Science.

In the arrangement of our curriculum the pupil begins the study of zoölogy with the fourth term of his course. Physiology follows with the succeeding term, and botany continues the work with the sixth term. The Natural Science for the seventh and eighth terms is physics and for the ninth is chemistry.

#### PLAN OF WORK IN ZOÖLOGY.

In the first place it is held that zoölogy is the study of animals and not of a book about animals. Hence the first step in each group of animals is the careful study of the best available type of that group. If possible, the students are asked to help collect the material in order that they may know how to collect when they become teachers, and that they may have a real knowledge of the habits of the animals by seeing them in their native haunts. They are thus led to note their surroundings, their mode of life, adaptation in color, and other means of escaping observation and capture. The animals are kept in cages or aquaria, in as nearly natural conditions as may be, and are carefully observed. The most merciful mode of killing each sort is taught and the type is selected. In connection with all this, reading is kept up in the best books of reference. But it is firmly maintained that Nature is the text book and that the contents of the library furnish the illustrations, that is, throw light upon that

which, by itself (chiefly on account of the brief time allotted to the study) would not be sufficiently clear.

In this manner a series of types is studied, representing the different branches of the animal kingdom. Chief stress is laid on the forms found in the neighborhood, and to those forms which are likely to be of most interest and profit in teaching the subject to children; for it is all along borne in mind that the main object of the work is not so much merely to acquire knowledge of the animals themselves, as to prepare for guiding children in the study of these forms.

The order of study of these types is determined by the season. Thus, in the fall, insects and birds are first studied before cold weather sets in, making these forms scarce and hard to obtain, while mammals, for instance, can be easily obtained in the winter (rabbit, as a type).

Carefully written descriptions and drawings are made of the types and of their organs as the work progresses. These notes and drawings are usually made on separate slips of paper, so that at the end of the term they may be arranged in the order of the accepted classification. The notes are indexed and neatly bound. Experience shows that the students set high value on these notes, and make use of them later in teaching.

It is hoped that each student will become more observing and more thoughtful of what he sees and will lead the children in the same paths, and that he will develop in them a closer intimacy and deeper sympathy with the manifold beauties of nature.

#### PLAN OF WORK IN PHYSIOLOGY.

The plan of work in physiology is essentially the same as that for zoölogy. Of course the students cannot dissect the human body, but they take the rabbit or cat as their type and find in it organs essentially like those

of their own bodies. Wherever possible the organs of larger animals are studied, as the heart and lungs of a calf, pig or sheep; and from these animals the eye, kidney, larynx, etc.

Chemical and physical experiments illustrating the processes of respiration and circulation are performed (so far as possible by the student himself). Here, also, notes and drawings are made.

Special stress is laid on the order of topics that a natural sequence may be followed.

Particular attention is also paid to practical hygiene, as regards the life of the student or other sedentary worker.

#### ARTICLES EXHIBITED TO ILLUSTRATE THE WORK OF ZOÖLOGY AND PHYSIOLOGY.

1. Note books of entire class in zoölogy containing descriptions and drawings of animals studied during the fall term of 1892.

2. Enlarged drawings, framed. Samples of chart work in water colors.

3. Series of stuffed birds and bird skeletons. Models of clams and snails, clam book.

4. Sixty jars of alcoholic specimens including a series of cats, showing:—

1. Organs in natural positions.

2. Pancreatic and bile ducts.

3. Thoracic duct, two, (1) showing brain and spinal cord, portal vein, urinary system, sympathetic system, arteries and veins, arterial distribution, diaphragm (2), sciatic nerve.

4. Twelve dissections of salamanders, showing the different organs.

5. Twelve dissections of crayfishes.

6. Dissections of heart (4), larynx (2), head (3), starfish, sea-urchin, clam, cat's tongue, cat's brain, horse-shoe crab (2), earth-worms (2), eye muscles of fish, valves of pulmonary artery.
5. Set of material used by teacher and pupils. Drawing materials, dissecting instruments, injecting apparatus, microscope, etc.

#### PLAN OF WORK IN BOTANY.

The plan here is very similar to that for zoölogy. A series of plants is selected for types and carefully studied. Their external form, color, etc., are considered and their microscopic structures are brought out. The germination of seeds, the functions of the different parts, their adaptation to the soil, air, and other surroundings, are all considered. Each pupil is required to make a collection of plants.

#### ARTICLES EXHIBITED.

Set of note books of whole class of spring of 1893. A number of selected herbariums. Selected specimens from these herbariums mounted in a wall case.

#### PLAN OF WORK IN PHYSICS AND CHEMISTRY.

The work in this department has a double purpose. It aims:

- (a) To give an elementary knowledge of the subjects, and,
- (b) To furnish the student with a scientific method of arriving at truth.

In order to accomplish this end the work must be both qualitative and quantitative; it must furnish an opportunity for original thinking and constructing, and it must insist upon exact quantitative results as well. Accordingly about three-fifths of the time allotted is given up to experimental work in the laboratory with

simple apparatus. A laboratory manual is used and permanent note books are kept by each student. This work is supplemented by the use of a text book and by class recitations.

The exhibit was prepared from the work in physics, and aimed to show not only the plan of work as carried out here, but also that physics can be taught successfully by the experimental method in schools of limited means.

#### THE EXHIBIT INCLUDED THE FOLLOWING:

1. Note books, temporary and permanent, showing their construction and plan of work used.
2. Simple apparatus made in the laboratory to illustrate and determine the facts and laws studied.
3. Measurement—a balance.
4. Fluids.
  - (a) Specific gravity by balancing columns.
  - (b) A hydrometer.
  - (c) Boyle's Law.
  - (d) Capillary action.
  - (e) The common lifting pump.
  - (f) The hydro-static press.
  - (g) A water wheel.
5. Dynamics.
  - (a) Composition of angular and of parallel forces.
  - (b) Laws of the lever.
6. Heat.
  - (a) Coefficient of expansion of solids.
  - (b) Coefficient of liquids and of gases.
  - (c) The boiling point of a thermometer.
  - (d) The still, showing construction of parts, viz.:  
water-jacket, condensing tube, supply pipe,  
escape pipe.
  - (e) Latent heat of water.
  - (f) A differential thermometer.

## 7. Magnetism.

- (a) Magnets and electromagnets.
- (b) Electrostatic induction.
- (c) Gold-leaf electroscope.
- (d) Electrophorous.
- (e) Electric condenser.
- (f) Insulating stool.
- (g) Tumbler cell.
- (h) Tangent galvanometer, showing construction of parts, viz.: the wooden circle, the circle wound with wire, etc.
- (i) Astatic galvanometer.
- (j) Mercury cups.
- (k) Current reverser, showing construction.
- (l) Wire connector.
- (m) Comparison of resistances.
- (n) Induction coil.
- (o) Electrolysis cup.
- (p) Telegraph.
- (q) Telephone.
- (r) Electric motor.

9. Sound—a sonometer.

10. Light—a photometer.

## GEOGRAPHY.

The subject of descriptive geography is studied during the first and second terms of the pupils' course. Guyot's Lectures on "The Earth and Man" constitute the course in physical geography, which is taken during the sixth term.

The work in geography commences with an analysis of geographical ideas and a careful organization of the preparatory work which must be performed before the subject of real geography is entered upon. This work will include such ideas as distance, direction, slopes, ele-

vations, plains, water courses, etc. Elementary sketching, molding, sand modeling, and kindred devices are introduced. As illustrating the methods to be employed in geography, and for the purposes of knowledge on the part of the teacher, the various continents are examined and a course of geography carefully outlined. The character of the work could be very well ascertained by a study of the fifteen volumes of written work, the ten bound volumes of maps, the twelve framed maps, and the framed plans of study. The bound volumes included outlines of a full course in geography, study of home geography, geography of New England, of North America, of Europe and of Asia, mathematical geography and physical geography.

The bound volumes of maps showed the results of tests given to the classes on the memory of form and position. They contained maps of Lake Michigan, Lake Superior, Lake Erie, Lake Champlain, Basin of the Delaware, Charleston and vicinity, Georgia, Florida and Alabama, Kentucky and Tennessee, Washington City and vicinity, Italy, Danube River, Norway and Sweden, France, Spain and Portugal, Black Sea, India, State of Washington, and two volumes of miscellaneous maps.

#### HISTORY.

To illustrate the methods in history the following work was exhibited: Colonization period, two volumes; Burgoyne's Invasion, three volumes; Washington's Administration, two volumes; From the Rapidan to the Appomatox, one volume; History of Greece, three volumes; Charlemagne, one volume; The Saracens, two volumes; Henry VIII, one volume.

## CIVICS.

The study of civics is pursued during the fourth term of the course. The methods of instruction do not differ in any essential feature from those employed in history. They were illustrated in three volumes: *How to Teach the Constitution*, *Town and County Government*, and *Government of Illinois*.

## READING.

In connection with the regular reading work the pupils are given a considerable amount of physical training under the direction of an expert especially prepared for the work. The character of the work could be learned quite readily from a considerable number of photographs showing classes of young men and young women in various positions and engaged in various drills. The method employed in the reading class was also illustrated by examination work exhibited in bound volumes. It showed especially the course by which a critical examination of the text is secured and how an adequate expression of the thought and feeling may be obtained by a series of questions rather than by the principle of imitation. The method of teaching reading in this Institution is somewhat peculiar in that it has strongly emphasized that feature of the work.

## LITERATURE.

Our work in literature for two terms follows three lines; the history of English literature, class-room study of English masterpieces, and private study of special works, chosen not from English literature alone but from the literature of the world. A third term is given to Shakespeare exclusively. In the historical study we emphasize the relation of English literature to the life and

character of the English people, and seek to lead the student to see that literature is not an accident, but an out-growth of life. Accompanying this is a detailed class-room study of representative authors from Chaucer to Tennyson, in which we are mainly concerned with the ethical, historical, and artistic aspects of literature. Further, the results of the private study, referred to above, are presented to the class in critical essays and are there discussed. The term given to Shakespeare completes our required course in literature. It includes class study of two or more plays and private study of three more, with two essays for each student, and several days' discussion of each play read privately. Most of this work cannot be presented in a paper exhibit. We sent to Chicago several volumes of essays, representing the results of private study, and, in some measure, the power acquired in the class room.

#### RHETORIC.

In our work in rhetoric we seek three things; a pure diction in speech; a greater enjoyment of good English in books; and an appreciation of the fundamental qualities of good composition,—unity, directness, and simplicity. We give more time to problems of structure than to questions of ornament. The old text books gave prominence to such topics as grace, beauty, and sublimity; we try to work in the spirit of the new, and are more concerned with the formation of the sentence, the paragraph, and the composition. Our exhibit in Chicago was made up of volumes of regular class exercises discussing such topics as, The Paragraph in General; Introductory Paragraphs; Transitorial Paragraphs; Summaries; Unity; Distinguishing Features of Narration and Description, and Types of Arguments.

## MATHEMATICS.

The exhibit in mathematics was intended to set forth some characteristic features of the work in arithmetic and geometry. The general method in arithmetic is first to present every process as a process with numbers of objects,—then to teach the process with figures as representing the real operation with things. To exemplify this method there was a series of papers in the several stages of the development of fractions, and another showing the manner of dissecting the prism, pyramid, and sphere, to derive the formulæ for the mensuration of those forms. All these papers were prepared by the students, and each set included the work of the entire class.

In our work in geometry especial attention is given to the logical mechanism of the demonstration, to accuracy and elegance of form in oral recitation, and to exercises in geometrical invention. The work prepared consisted of about thirty original demonstrations by each member of the class, and a series of pasteboard figures and wooden blocks illustrating the leading propositions of solid geometry.

## DEPARTMENT OF ANCIENT LANGUAGES.

In this department the exhibit was naturally one of manuscripts. A liberal number of papers prepared by the pupils—partly the result of class room tests and partly the fruits of home labor—bound in handy volumes, revealed the extent to which the pupils had mastered each of the eleven terms' work in Latin and the seven terms' work in Greek in the High School Course.

It was not the aim of the exhibit to vent new and startling theories. It was not so much its purpose to display any hitherto untried modes of instruction as to redemonstrate the effectiveness which may attend the

faithful pursuance of the more conservative and better approved methods now actually practiced in many of our best schools. The "induction method" in its full scope, has not been adopted; simplified texts are not used; Cæsar is still regarded as good reading for third term pupils in Latin.

The volumes of manuscript were prepared for the following ends:

(1). To show by the character and the amount of work written in a limited time, that both exactness and facility had been acquired in handling the fundamental inflections. (2). To show that the main principles of syntax had been mastered. (3). To show an ability to translate Latin and Greek into good, forcible English, and to do so without the ordinary needless wanderings from the literal. (4). To show an aptness in writing Latin and Greek. (5). To show that the pupils had learned how to translate at sight. An increasing effort is being made to bring the student to the habit of approaching an assignment for translation with more reliance upon his thought and less upon his vocabulary. (6). To show a fairly complete acquaintance with the immediately related history, geography, mythology, biography, etc. (7). To show some appreciation of the real value of the masterpieces of classical literature read in the class room. A special effort is made to study strictly from a literary standpoint, and quite extensively, a limited portion of each author read; while every lesson in translation is aimed to be also an exercise in English composition. (8). To show that the pupils have some ideas at least of the lineal and cognate relationship of the English language to the Latin and to the Greek. The researches of men like Diez, Littré, and Brachet, into the origin of French, coupled with those of Skeat, Morris, Sweet—into the development of modern English

from Anglo-Saxon, have at length made possible a scientific treatment of Latin as the mother of more than two-thirds of our English vocabulary; while in the wider field of Indo-European philology, the brilliant work of Bopp, Grimm, Verner, Brugmann and a host of others, has rendered just as fruitful the study of Latin, Greek, and native English as cognate or sister tongues.

#### GERMAN.

Manuscripts covering two years' work in German showed that hard work had been done all along the line of quite an extensive course in grammar, simple prose, classics and conversation.

#### DRAWING.

In our work in drawing we seek to do three things: to teach drawing as a language, to lead pupils to seek culture from the beautiful in nature and in art, and to promote mental development. The characteristic feature of the work in the Normal School is picture drawing (perspective representation).

The course, which extends over a period of two years, two lessons per week, may be outlined as follows: Ten lessons in form study—expression in clay; fourteen lessons in construction drawing, noting only the elementary facts of orthographic projection; twenty lessons developing the principles of free-hand perspective; twenty lessons in light and shade; twenty lessons in representation with water color; twenty lessons in illustrative drawing in which an effort is made to acquire skill in rapid blackboard work; twenty-six lessons from the history of art, pupils noting the styles of architecture and sketching freely the characteristic features.

The exhibit at the World's Fair was arranged to show, so far as we could, the results of the above outline. It consisted of thirty-six portfolios containing the home and

class work in quantities to suggest the average work of the pupils. There were also eight volumes of essays and drawings compiled from the papers of the pupils written in connection with the history lectures. Fifty tablets were on file showing the work from day to day in the class room. The *made* work in clay and paper was exhibited in two glass cases.

In the collection of photographs were pictures showing the class room, the pupils at work, and the equipment in the way of casts, models, etc.

With the exception of about a dozen large drawings, there was no work in the exhibit which was not the work of the pupils, it being the aim to have our exhibit suggestive, not only in theory but in practical results.

#### PURELY PROFESSIONAL WORK.

The purely professional work begins with the pupil's admission to school. For the first term it consists of two exercises each week. After developing an outline of the general ideas of pedagogics, the pupils begin the study of educational ideals as illustrated in the history of various peoples and of the successive attempts made by reformers to improve existing educational conditions. China, Japan, Greece, Rome and the modern European world are examined with more or less minuteness. The movement introduced by Comenius is studied with considerable care as it may be regarded as the introduction of realism, or the study of the external world, into the methods of education then prevalent. Rousseau, Pestalozzi and Froebel are examined for the purpose of rendering clear the ideas for which they stood, and the progressive movement which has been going forward with more or less steadiness since the Revival of Learning.

With the beginning of the second term the pupils take up the subject of special method which occupies them for

two terms, five hours a week. History and literature for the first six grades are first discussed, and they are followed by geography, reading, language lessons, and arithmetic. The work is preceded by a discussion of the principles of attention and apperception especially. The general ideas brought out in the first term's work also become a basis for the work of the second and third terms. Space will not permit a detailed account of the method of procedure. In passing, however, it should be said that in history and literature fairy tales are made use of in the first grade, Robinson Crusoe in the second grade, The Tales of Troy in the third grade, American History stories in the fourth and fifth grades, and the study of Colonial History especially in the sixth grade.

#### THE EXHIBIT

Contained several volumes showing the character of this work. These volumes were prepared during the ordinary recitation period in answer to certain questions written upon the board. They were, in effect, examination papers upon topics covering the successive stages of a development of the subject.

#### PSYCHOLOGY

Is introduced at the beginning of the second year. An attempt is made to have it constitute the basis of a rational methodology. The method work of the first year is necessarily simple and cannot be made to rest upon the truths of psychology in a highly conscious way. Owing to the fact that the demand for even partially trained teachers is so great the average pupil remains with us only a little over three terms. A special effort is made, as soon as the study of psychology is begun, to show its close and vital relation to teaching. Consequently, we study Applied Psychology at first. As soon as any

phase of mental activity has been discussed the educational principles to be derived from it are at once considered. Another reason for introducing elementary psychology at the beginning of the second year is the fact that the practice work in the model school regularly begins with the second term of the second year and all possible preparation is needed for that experience. Psychology is again taken up at the beginning of the third year and is continued for seven months. Here the work is pursued far more vigorously, the more difficult phases of the subject receiving attention.

At the conclusion of this work three months are devoted to the study of the Philosophy of Education as developed by Dr. Rosenkranz. This necessitates the review and application of certain principles of psychology.

Three hours a week during the third year are devoted to the study of general method, including apperception and kindred topics, and to the criticism of class exercise.

#### THE EXHIBIT

Of this work consisted of a number of bound volumes containing the results of examinations upon the different topics, extending over a considerable part of the course.

#### THE PRACTICE SCHOOL.

The school is accommodated in a two-story brick building just north of the main building. It has six rooms on the first floor, and nine on the second floor. Five of those down stairs are large rooms, capable of serving as regular school rooms with desks. One is an office. On the second floor, all, except the large assembly room for the grammar school, are for recitation purposes for small or medium-sized classes. Three of the rooms are sub-divided by partial partitions so as to secure room for more classes. Two of the halls or dressing

rooms are also used for small classes. There are several times in the day when every available space in the building must be used for class-room purposes.

In the basement are four well-lighted play-rooms, two for the boys and two for the girls, which are very freely used by the children in bad weather. The noon pupils also take their dinner in the basement. The closets for both the boys and the girls are in distinct parts of the basement, the dry closet system being in use. The ventilation of the building is excellent, there being a constant influx of fresh air which passes over hot coils and into the school room, about eight feet from the floor, and the bad air being constantly drawn off through openings near the floor. On the campus are ample playgrounds near the building.

The purpose of the practice school is to furnish opportunities under good conditions for Normal School students to observe good instruction in classes and to participate in the work of managing and instructing children.

Before beginning the work of teaching, Normal students usually complete the first year of studies in the Normal course. Besides a thorough drill in the common English branches, this includes three terms of special study of the history and methods of teaching. Those having charge of these classes in the Normal Department are accustomed to illustrate their ideas of teaching with classes of children. The recitations are held with children in the presence of the Normal students and then a close criticism of the class work follows.

About one hundred and thirty Normal students are regularly employed in teaching classes in the Model School. Each student takes full charge of a class in one subject for a term of twelve or fifteen weeks, and is required to teach for four such terms before graduation. He is fully responsible for the instruction and success of

the class. His work is carefully scrutinized by the regular critic teacher who examines the plans of his work, carefully arranged beforehand, and encourages or criticises his methods and bearing before the class. There are four such critic teachers who devote their entire time to the work of supervising the recitations of Normal student-teachers,—one critic teacher for first and second grades, one for intermediate grades, and one for the grammar school, and one superintendent, whose duties are to organize and unify and manage the instruction throughout all the grades. The superintendent also meets all the teachers regularly once, often twice, a week, for the discussion of problems in teaching, for general criticism, and for keeping up the right spirit in the school.

Besides the critic teachers there is a principal of the Grammar School who has general charge of the discipline and management in that department and teaches several classes, especially the preparatory classes for the Normal and High Schools.

There are also four assistant teachers whose duty it is to take charge of the general discipline and control of the rooms in the four primary and intermediate schools. They are really room teachers who teach part of the time and are responsible for the studies and conduct of a single room each.

A Model School of this kind has some peculiar difficulties and problems. It is called upon to secure systematic, good teaching by young teachers, and can succeed only by close and watchful criticism. Such a school is also expected to stand well to the front in advanced and improved methods of teaching, at the same time that it prepares teachers daily for the schools as they really are, and not as one might wish them to be.

## EXHIBIT.

## I. Literature as used in first grade.

Books of fairy stories—from Andersen and the Grimms, changed in form only so far as necessary in order to adapt them to the understanding and highest appreciation of the children.

These stories are given to the little ones orally by the teachers after which they are reproduced by the children.

Only so much of the story is given at one recitation as can be well learned and told by the children at that recitation. In these reproductions the children express themselves freely, the teacher correcting errors in grammar and pronunciation.

These stories are chosen because we consider them the best classical literature for children of the age, for:—

1. They are readily comprehended and thoroughly enjoyed by the children, they being fitted for the children of their age in that

(a) The child is imaginative to a high degree and the stories are very fanciful.

(b) They deal with objects in nature with which the child is familiar and in which he is already interested.

(c) In form the language is such as the child understands and likes—not always just the language that he would use, but he sees in it a better, more beautiful expression of his own thoughts, hence:—

2. The child's own vocabulary is increased and enriched by their study.

3. They supply the mind of the child with an abundance of good thoughts of the best writers.

4. With such food for thought a taste for the best literature is encouraged, a taste which leads him to reject the mediocre or bad.

5. Great moral truths underlie most of the stories. These truths do not thrust themselves above the sur-

face in such a way as to annoy and hinder the child in his onward progress in the story, but his feelings are thoroughly stirred and judgments are voluntarily and unconsciously passed which he applies to his own actions.

II. (a) In connection with these stories a large number of drawings made by the children, illustrating different passages in the stories, were sent to the Fair.

These drawings, besides serving as training to the hand and eye, give vividness to the story. They give the child a chance to express himself in another way than by oral reproduction. They also show the teacher whether or not she has been successful in getting before the child a clear and accurate mental picture.

(b) Pictures illustrating "Robinson Crusoe," in second grade, and Hawthorne's "Tanglewood Tales" and "Wonder Book", in third grade, were sent; also a number of sketches were made by the children while studying the Pioneer History stories in the intermediate grades.

III. Written Language. Papers written by pupils from the first to the eighth grades, inclusive, based upon literature, science, history, and geography. These papers showed the progress made by the pupils in ability to express their ideas, also the improvement made in penmanship, punctuation, etc. This is the third method of expressing themselves.

IV. Science. (a) Bottles of alcoholic specimens showing the different stages of development in the buds of box elder, soft maple, ash, horse chestnut, balm of gilead, Austrian pine and Norway spruce.

(b) Pressed specimens showing the above, also collections of grasses and sedges, and common wild flowers.

(c) Collections of insects.

(d) Drawings of the animals and plants studied, also of parts, as of the eye and stomach of the ox.

These drawing were made by the pupils of all grades, from first to eighth, inclusive. Besides training the eye and hand, they lead the child to observe more carefully than he otherwise would.

V. Reading. A set of reading books used in the first primary. The stories were short ones which had been given by the children in answer to questions put by the teacher, based on the literature and science work. These sentences were placed on the board by the teacher. After the children recognized a written sentence as identical with the one they had given orally, the words in the sentence were learned from their position, and afterwards recognized wherever found.

VI. Writing. Children's books showing the work for a year in the different grades.

VII. Number. (a) Children's books showing a year's written work in the first three grades.

(b) Charts picturing the tables of liquid and dry measure. Much concrete work is given in these three grades. These concrete stories are based upon the science and literature.

VIII. Geography and History. Sketches made in the class from memory.

IX. Clay Molding. Many pieces made by children in the primary department, of objects studied in science and literature: e. g., leaves and buds of trees, beans and peas in pod, in science; and in literature, Robinson Crusoe's canoe, his dishes, fire-place, etc.

X. Paper-cutting, based also on science and literature: e. g., fruits, leaves and flowers in science; and in literature, "The Ugly Duckling," "The Coal of Fire," "Bean and Straw out Walking," etc.

XI. Collections of poems and songs for primary grades.

XII. Daily plans of pupil teachers, as prepared by them each week. These plans are criticised by the critic teach-

ers and suggestions made to the teachers whose work, as planned, is not satisfactory, before they hear the recitation. By so doing many mistakes are avoided.

XIII. Observation notes made on pupil teachers' class work, by Normal students observing the work done.

These notes are read by the one whose work is thus under scrutiny and he is given a chance to reply before the critic teacher reads the notes and replies.

This work, if well done, is very helpful, (a) to the teacher of a class, whose faults each day are set in order before him; (b) to the observer himself who must give clear and sound pedagogical reasons for his criticism; and (c) to the critic teacher who finds out without visiting the class every day, how the work is being done and what control the pupil teacher has over his class.

#### FURTHER EXHIBITS.

In addition to the exhibits noted, a large number of photographs were presented showing exterior and interior views of the building, views of the campus from the cupola of the main building, and views of the immediately adjacent portions of the town and surrounding country. The purpose of these pictures of the environment of the school was to show to observing students of our exhibit the physical setting of the institution. Planted in the midst of an agricultural region of marvelous fertility, inhabited by a thrifty and intelligent race, it must receive from its surroundings influences which cannot be ignored in determining its character.

In order that our exhibit might be more clearly understood we published a carefully prepared pamphlet giving in considerable detail the course of study, careful outlines of special work, and a great many explanatory paragraphs all of which were intended to supplement the objective exhibit. This pamphlet was paid for by the Institution.

## CONCLUDING REMARKS.

I desire to acknowledge the assistance of the heads of the several departments in the preparation of this report. In several instances their contributions are introduced without modification.

Recalling again the statements with which this report was begun, that peculiar difficulties attend any effort to show objectively the work of educational institutions not devoted especially to the production of skill in the arts, and expressing anew our appreciation of the numerous courtesies on the part of the Board of Management, the foregoing is respectfully submitted.



EXHIBIT, UNIVERSITY OF ILLINOIS, CHAMPAIGN.





UNIVERSITY OF ILLINOIS, CHAMPAIGN.



## UNIVERSITY OF ILLINOIS.

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**T**HE University of Illinois has its seat in Champaign county in the eastern central part of the State, between the twin cities of Champaign and Urbana, within the corporate limits of the latter. It is one hundred and twenty-eight miles southward from Chicago, at the crossing of the Illinois Central railroad by the Cleveland, Cincinnati, Chicago & St. Louis and Wabash railways. The Institution has made, during recent years, rapid advancement in all that constitutes a great state university, and in several respects now stands unrivaled among kindred institutions of learning in the country. It has large endowments and is further generously supported through appropriations by the State Legislature.

The land occupied by the University and its several departments embraces about two hundred and eleven acres, including campus, experimental farm, orchards, forest plantation, arboretum, and military parade grounds. The six main buildings are situated upon a very beautiful campus kept in excellent order.

University Hall, designed wholly for public uses, occupies three sides of a quadrangle, measuring two hundred and fourteen feet in front and one hundred and twenty-two feet upon the wings. The library wing contains in spacious halls the museum of natural history, the library, the art gallery, and the museum of industrial art. The chapel wing contains the chapel, the physical and electrical laboratories and lecture room, and rooms occupied by the departments of architecture and of art and design. In the main front are convenient class rooms, and on the upper floor elegant halls for literary societies.

The Chemical Laboratory is a building seventy-nine by one hundred and twenty feet, and two stories high, besides well lighted basement and mansard stories. It contains the general laboratories for students, instructors' laboratories, lecture rooms, store rooms and various departments for special purposes.

Machinery Hall is of brick, one hundred and twenty-six feet in length and eighty-eight feet in width. It contains a boiler room, a machine shop furnished for practical use with a steam engine and lathes, and other machinery, pattern and finishing shop, testing laboratory, shops for carpentry and cabinet work, and is furnished with wood-working machinery. The blacksmith shop contains sixteen forges with anvils and tools, and a cupola for melting iron.

Natural History Hall is a handsome building one hundred and thirty-four by ninety-four feet, with basement, two main stories and an attic. It is occupied by the departments of botany, zoölogy, mineralogy, geology, and physiology, for each of which there are ample laboratories, lecture rooms and offices. Here also are the offices of the State Laboratory of Natural History, of the State Entomologist, and of the Agricultural Experiment Station.

Military Hall, one hundred by one hundred and fifty feet in one grand hall, gives ample space for company and battalion maneuvers and for large audiences upon special occasions. It is also used as a gymnasium, for which there are dressing rooms with lockers. A bath room is provided.

Engineering Hall, now in course of erection, is to be the best building among the group of good ones. It was designed by a graduate of the school of architecture and is now under his general superintendence in construction. It is T shaped, with an extreme frontage of

two hundred and eight feet and depth of one hundred and forty feet. It is four stories high, including utilizable basement and attic. It is designed to accommodate the work in mechanical, electrical, civil and municipal engineering, in architecture and in physics. For these purposes there are full suites of rooms intended for offices, lecture rooms, drawing rooms and laboratories.

There are, in addition, several smaller buildings for various special purposes.

The University consists of four colleges devoted to undergraduate work, and of a graduate school. There is also a preparatory school. The organization is as follows:

I. The College of Agriculture.

Regular course in Agriculture.

Junior course in Agriculture.

Course in Horticulture.

II. The College of Engineering.

Course in Mechanical Engineering.

Course in Electrical Engineering.

Course in Civil Engineering.

Course in Municipal and Sanitary Engineering.

Course in Architecture.

Course in Architectural Engineering.

III. The College of Science.

Natural Science group.

Chemical group.

Mathematical group.

Philosophical group.

IV. The College of Literature.

Elective Courses, such as:

Classics,

English and Modern Languages,

Mathematics,

Philosophy,

Pedagogy, etc.

## V. Graduate School:

Courses for Masters' and Doctors' degrees.

*Vocal and Instrumental Music* are also taught, but not as parts of any regular course.

*Preparatory School:* A preparatory school with a course of two years exists. In this are taught the subjects necessary for entrance to the University.

The undergraduate courses of study extend through four years and lead to appropriate degrees. In the College of Engineering the curriculum in each department is prescribed and in order to graduate students are obliged to complete the work as laid down, but in all other departments great freedom in choice of studies is permitted. Aside from the few required subjects, and upon condition of following chosen lines long enough to make them of recognized value, all courses of instruction are freely open to those who are prepared by previous training to take up the work. Instruction is by the research or laboratory method, in whole or in part, whenever this is practicable, so that students are trained to do things as well as to memorize and to comprehend what others say; to find facts as well as to learn facts. In the shops they become expert with their hands, while in the class rooms they gain knowledge and discipline of mind. In the science laboratories they deal with objects rather than with books, though the latter are by no means neglected. In the libraries they study literature, history, etc., from original sources, in correlation with the lecture room requirements and opportunities. For the so-called practical side of instruction extensive equipment exists; otherwise it would have been impossible to have shown at the World's Fair the very large amount of material exhibited and at the same time have carried forward the regular work of the University.

In the graduate school instruction and facilities of research work are offered to those who have satisfactorily completed undergraduate work in this or in other collegiate institutions.

For the year 1892-93 there were enrolled seven hundred and fourteen students—an advance of one hundred and thirty-one over that of the preceding year, and of nearly 40 per cent. over the enrollment for the year 1890-91.

#### THE UNIVERSITY EXHIBIT.

The exhibit made by the University was divided into six general departments, viz.: a small general exhibit, one for the school of art and design, and one for each of the four colleges. The general office or headquarters faced north on the central aisle of the building and was entered under festooned national flags draped over stands of Springfield rifles on either side, representing the equipment of the military school. Within the enclosure were shown, in frames, large exterior views of the University buildings and sixteen interiors; one frame, photographs of the members of the board of trustees; one frame, photographs of members of the faculty; life-size portraits of the three regents; one large frame containing photographs of four athletic teams; three frames, program of instruction; one framed list of periodicals.

#### COLLEGE OF LITERATURE.

The exhibit joined that just described on the south and extended to the aisle next to the Women's Department. Here were large reproductions of photographs of interiors of the University library, lecture rooms, halls for literary societies, etc., and a series of large photographs of Grecian and Roman architecture and scenery, used in connection with instruction in the ancient classics. There

were thirty-six volumes of examination papers, twenty-two volumes of essays, orations and translations, and nine volumes of graduating theses, illustrating work done by students of the college. Here, also, were maps and charts illustrating methods of instruction, collections of periodicals and text books, and a case of apparatus and models used in class work in elocution and oratory.

The exhibit of the department of pedagogics, also in this space, consisted chiefly of a very full collection of the periodical literature of the world upon the subject. Of the four hundred and eighty-three educational periodicals shown, one hundred and twelve were from the United States, one hundred and eight were in the German language (Germany, Switzerland and Austria), and one hundred and fifty-eight were from Spain. All the Central and South American states were represented, as was every country of Europe and Asia except China.

#### ART AND DESIGN.

The exhibit was shown in one hundred and nine frames, including work from the six courses, though the greater amount came from the regular course in art and design and the special course prepared for students in architecture. Less than five per cent. of the pupils entering this department received previous instruction in free-hand drawing, and the exhibit covered work from the first exercise of the first term to the last work of the third year. The exhibit consisted of three parts: That of the first year's work—(a) pencil drawing from geometric solids, common objects (as books, vases, tables, chairs, etc.), interiors (as the corner of the room), casts and flowers and foliage from nature; (b) the light and shade of common objects, and plant and animal form from casts. That of the second year's work—(a) modeling in clay, orna-

ment and detail of the human face; (b) oil painting from groups of still life; (c) water color painting from groups and flowers from nature. That of the third year's work —(a) modeling from the antique and from life; (b) oil and water color painting; (c) drawing from the antique and from life.

#### AGRICULTURE AND HORTICULTURE.

The College of Agriculture and Agricultural Experiment Station had a joint exhibit. There were framed photographs, representations of the building and grounds, plats and maps of the farm, and six glass cases of cereals in their various states of preservation, showing size and manner of growth as well as yield and quality. A chemist's work desk and outfit were shown illustrative of this department of the Experiment Station and of the work accomplished, including a number of special contrivances invented by those in charge. Horticulture was represented by a large show-case of wax casts of orchard and garden fruits, vegetables, etc., a collection of tree trunks from the artificial forest tree plantation, and by specimens of grafts, trained fruit trees and root developments. A large series of ears of sweet corn mounted on exhibition boards, showing originals and the results obtained by cross-fertilization, attracted much attention. The botanical department of Experiment Station showed a collection of seeds of eight hundred Illinois plants, a herbarium collection of specimens of introduced plants (by birds) from the college forest-tree plantation and a collection of specimens illustrating all the most destructive diseases of cultivated plants in the State due to parasitic fungi. The diseased plants were pressed and mounted on card boards on which were also magnified representations of parasites. Besides the names of the host plants and fungi, there were also attached directions for combating the attack of

the latter. The veterinary department showed a life-sized dissected model of a horse, skeletons of the horse and cow, models showing the age of horses by their teeth, and tools, apparatus and drugs used in practice. This College and Station exhibit taken together was a very large one of its kind and was abundantly inspected. The space adjoined on the west those of the general exhibit and of the College of Literature, south of the central aisle.

#### COLLEGE OF SCIENCE.

The department of chemistry showed a work desk with fittings, apparatus and chemicals complete, as furnished to students for the prosecution of their work in the various branches of pure and applied chemistry in the University. Many sets of apparatus arranged as they are employed in the actual chemical processes were exhibited, and some of these were in operation, thus illustrating more fully the precise use made of them. A set of one hundred and fifty finely crystallized inorganic compounds made by students in the course of their laboratory practice was shown, together with several lots of laboratory waste mixtures from which chemically pure substances had been made. A set of one hundred and twenty-two organic compounds prepared by students, and including a number of such substances as saccharine and indigo, made synthetically, illustrated the scope of the student's work and the care and skill exercised in manipulation. There were also other supplementary organic and inorganic substances, not prepared by students, but forming with the others complete and valuable collections of the chemical elements and their combinations, which are used in the class room in illustration of the subjects there discussed. The work in quantitative analysis was represented by the actual apparatus used, including a fine balance, and by

sets of constituents giving graphic illustration of the quantitative chemical composition of such ordinary substances as milk, butter, wheat, corn, clay, coal, feldspar, glass, cast iron, brass, etc., which had been prepared in correspondence with the results of analyses made by students in the ordinary course of work, the students' reports of the analyses being exhibited together with the illustrative material. Thus: A quart of milk was exhibited and adjacent to it, in bottles plainly labeled, were shown the quantities of water, butter fat, albuminoids, sugar and mineral matters contained in the quart of milk, as determined by the student in his analysis; and besides the set of bottles with their contents was the tabular statement of results which the student is required to make when each analysis in duplicate is completed. The exhibit of each of the other substances in this set was in all respects similar to that of the milk.

The course in pharmacy was represented by the sets of apparatus and material supplied to the student and by a small set of samples of the crude drugs which are used in the instruction of pharmacognosy. The actual work of the course was exhibited in a collection of one hundred specimens of various galenical preparations which had been made by students in the ordinary course of their pharmaceutical practice. In illustration of the progress made in the development of skill and knowledge, and as an indication of the students' ability in conducting partially independent investigations, there were exhibited a number of those which are required and which had been prepared by students who were candidates for the degree of Bachelor of Science in chemistry. Sets of photographs of the various lecture rooms, laboratories, balance room, store rooms, etc., served to indicate somewhat the facilities for chemical work at the University.

The exhibit of the department of geology included: (a) laboratory table like those in use at the University with a set of apparatus similar to that furnished to each student in mineralogy and lithology; a series of polished granites and one of marble to represent the collections in economic geology; a small collection of Illinois building stones with results of a series of tests upon them by a senior student during the preparation of his graduating thesis on "The Properties of Some Illinois Building Stone;" a relief map of Leadville to represent the series of such maps available for the study of regions especially interesting to the geologist; a series of charts prepared at the University to illustrate the action of dynamic forces; a series of lantern slides from photographs of localities in which the operations of these forces are well displayed; a model showing the actual movement of a point in the earth's surface during an earthquake which occurred in Japan; a lathe for cutting and grinding thin sections for the microscopic study of rocks, minerals and fossils; a microscope adapted to the study of such sections; small series of each of the groups, corals, crinoids and cephalopods, to represent the collection of fossils; six large casts of mesozoic, tertiary and quaternary fossils; antlers of an Irish elk taken from a peat bog in Ireland.

In the botanical department there were numerous photographs and bromide enlargements showing interiors of the laboratories and various views of the facilities and accommodations for the work at the University. In the exhibit there were a student's and an instructor's laboratory desk, each fitted out with the apparatus and materials used in study and research. A long desk with closets and drawers and a glass case with a display of a considerable amount of apparatus represented the provisions for work in bacteriology, while cultures of the organisms

in tubes, microscopical preparations, and photomicrographs illustrated results obtained. In one case were shown a series of ten microscopes which well illustrated the progress made in the construction of this instrument since it came into use in the laboratory twenty-three years ago. Here, also, were apparatus and articles used in vegetable histology, and prepared specimens. In the same case were shown equipments for photography and photomicrography with illustrative specimens of the arts. A third case contained various models of flowers, fruits, etc., for use in instruction; also botanical specimens of different kinds showing method of preparation for the herbarium and museum. A herbarium case containing twelve hundred species of Illinois plants properly mounted, was exhibited, together with a card index from which might be obtained an idea of the herbarium collection at the University. In another case were to be seen a full set of text and reference books, bound volumes of notes, and theses by students, and published contributions from the laboratory.

The exhibit of the zoölogical department was made up from the museum of the University, the models and charts used in class work, the apparatus used in collecting, studying and preserving specimens, by both instructors and pupils, and from work actually done by instructors and pupils. The exhibit contained a small collection of mammalia, among which were a buffalo, an elk, a puma, a porcupine, a young wolf, an ornithorhynchus, a civet cat, a moose deer, a proboscis monkey, a gibbon and its skeleton, a flying squirrel and its skeleton, and a bat. Seven species of birds were shown, among them being an apteryx and its skeleton, and an owl parrot with its skeleton. From the class-room apparatus were shown eighty-five wax models illustrating segmentation and gastrulation of the ovum, the embryology

of amphioxus, the embryology of the star fish, and the embryology of cheironomus. Fifteen charts illustrated various portions of the animal kingdom, and a full outfit of compound and dissecting microscopes, reagents, stains, dissecting tools, parafine baths, glassware, etc., from the students' laboratories, were brought together. Sixty-three dissections of insects, starfish and other radiates, crayfish, lobsters, salamanders, frogs, fish, serpents, turtles, birds and mammals, made by instructors and pupils, were arranged to show the anatomy of those animals. The insects on exhibition here were part of a students' reference collection. The collection contained of Orthoptera ninety-one specimens, Neuroptera twenty-eight, Hemiptera three hundred forty-seven, Coleoptera one thousand eighty-seven, Lepidoptera three hundred ninety-six, Diptera eighty, and Hymenoptera one hundred nineteen specimens. There were also in this department a case containing slides of minute crustaceans, Daphnia, Cyclops, Diaptomus and others, together with photographs of the same; and there were enlarged photographic views of the laboratories.

The purpose of the exhibit of the department of psychology was to show, among other things, the laboratory method of teaching the subject as employed in the University classes. The exhibit consisted chiefly of: I. Charts showing the results of the most recent researches in the field of cerebral localization; models of the brain; and prepared tissue. II. Apparatus: (a) such as is used in investigating the field of sensation with a view to determine the exact conditions under which sensations arise; (b) such apparatus as is employed in the measurement of the time rate of the mental processes; (c) apparatus made use of in determining the exact relation that obtains between mind and body; (d) apparatus used in testing and measuring the memory, attention, and other

psychical functions. During three months of the time in which the exhibit was in place, the instructor in this department at the University was in attendance much of the time, and at certain hours, appropriately advertised, performed a number of the more simple experiments to make clear to visitors the methods and purposes of using the various pieces of apparatus. Those who were especially interested were met by appointment and shown in a more thorough-going way the value of this work as undertaken at the University. A descriptive pamphlet was also distributed in large numbers.

#### COLLEGE OF ENGINEERING.

The exhibit by the mechanical engineering department showed work done by the students in the shops, in the drawing and class rooms, and illustrated the methods of instruction. Shop work was shown in groups beginning with plain exercises in wood and continuing through the entire course to the construction of complete machines. There were joint work in wood, exercises in turning, pattern work and core boxes. Work from the foundry was shown consisting of rough castings of simple and complicated designs. Forge work was illustrated by examples of welding in wrought iron and steel, as well as by tool construction and tempering. The showing from the machine shop was the most extensive and consisted of numerous examples of work done in the drill, lathe, shaper, milling machine and grinding machine. Many complete models were shown that had been made to illustrate principles in kinematics, gearing, belt transmission and steam engine design. In addition to the above exhibit of students' work, a portion of the space was devoted to machine tools in motion. Lathes, a shaper and a milling machine were set up and were run three hours each day, being operated by a graduate of the

mechanical engineering department of the University. This proved to be an interesting feature of the exhibit and brought out many inquiries that would not otherwise have been made. Several cases contained apparatus from the laboratory of the department and were intended to illustrate the methods of instruction in connection with laboratory work. The work in the drawing and designing rooms was shown by means of a series of framed drawings taken from each subject in which this formed an important part. Beginning with samples of machine drawings, such as vises, anvils, chucks, lathe and planer parts, the work extended through the elementary work in machine design, including connecting rod ends, gears, belt diagrams and bearings for rotating pieces, to a series of problems in kinematics and valve gears, and to a design for a complete steam engine. In addition to the work shown on the walls and in the cases, a more extended collection of materials and illustrations was kept in the drawers and portfolios accessible for inspection and to which attention was called by numerous cards posted conspicuously with the exhibit. Graphical charts showed at a glance much data compiled from the records of the University as to the growth and relative standing of the several departments.

The apparatus and materials comprising the joint exhibit from the two departments of physics and electrical engineering were selected with the purpose of showing the general nature of the experimental work undertaken, the kind of apparatus with which this work is carried on, and the character of the results obtained. In so far as the space allowed, the exhibit was arranged in such a way that a visitor approaching would have his attention first called to the most elementary work given in the department of physics, and then, as he passed along the main aisle, he would see the logical

development of the entire course precisely as he might see it were he to visit the laboratory from week to week throughout the year. Besides each group of apparatus and materials, arranged as for actual experiment, was placed a student's note book held open so as to show the record of observations, the computations and discussions of results for the particular experiment which the apparatus illustrated. The note books were selected at random from the notes of students for the years 1891-93, inclusive. There were thirty-six groups of apparatus showing the work done in mechanics, sound, heat, light and elementary electricity and magnetism. Immediately adjoining the collection of apparatus for general physics was arranged the apparatus for advanced measurements and original research in magnetism and electricity. The collection was made up of pieces representing the highest grade of work by American and European manufacturers. Next to this collection was a model dynamo laboratory which was in active operation three hours each day under the immediate charge of a graduate of the University. The plant was operated by a Jenney motor, which received current from the intramural electric railway. This motor drove an Edison compound dynamo. A model switchboard, fully equipped with switches, rheostats, voltmeters, ammeters and plugs enabled the operator to connect the dynamo with the incandescent and arc lamps of the plant, or with the storage batteries, motors, or other appliances which found place in the exhibit. This "line" exhibit was especially attractive to visitors. A series of twenty large bromide prints, arranged on the walls enclosing the space, showed the chief rooms in the laboratories and some of the most important parts of the University equipment not possible to represent in the exhibit.

The equipment of the department of civil and municipal engineering consisted chiefly of drawings, manuscript problems, and designs showing the nature of the instruction and the character of the work in subjects peculiar to the courses in civil and municipal engineering. The exhibit showed the work done in the classes in land surveying, transit surveying, topographical surveying and drawing, mapping, leveling, railroad engineering, road engineering, sewerage, bridge analysis and design, water supply engineering, geodesy and practical astronomy, and masonry construction. Several volumes of theses were exhibited to show the nature of the work required in this line. The text books and a few of the reference books were shown. The following inventory will give farther details concerning the exhibit:

*Land and Topographical Surveying:* Eleven frames containing manuscript problems and drawings; three frames containing photographs of apparatus and classes at work; fourteen bound volumes of students' work; three volumes of text books; one glass floor case containing transit, level compass, tapes, poles, etc. *Railroad and Road Surveying:* Ten frames containing maps, profiles, cross sections, etc.; three frames containing photographs of classes at work in the field; eleven volumes of students' field books; five volumes of students' library note books; seven volumes of text and reference books. *Masonry Construction:* Six photographic views in museum and in laboratory; six frames of problems, designs, and diagrams; four volumes of students' laboratory notes; one collection of test specimens with results; one large folio of drawings and designs; one text book.

*Geodesy and Practical Astronomy:* Three frames containing manuscript problems; three photographs of equipment and students at work; four volumes of students' class work; six volumes of test and reference

books; one glass floor case containing alt-azimuth instrument, sextant, chronometer. *Water Supply Engineering*: Nine frames of diagrams, drawings of stand pipes, distribution systems, etc.; Four volumes of students' lecture notes; Two volumes of text books. *Sewerage*: Twelve frames containing drawings of sewers and sewer appurtenances, designs of filtration plants, disposal works, etc.; one text-book. *Bridge Analysis and Design*: Six volumes of students' problems; ten frames of designs with details; three photographs of lecture room, museum, and bridge models; two volumes of text-books; one folio containing designs by students; three bridge models. *Miscellaneous*: Seven volumes of students' graduating theses; seven annual numbers of papers of students' engineering society; three diagrams showing courses of study, number of students and graduates.

The facilities and methods of instruction in mining engineering were illustrated by drawings, photographs and models, and by specimens, and apparatus. The extensive machinery used by instructors and students in this department could not, of course, be included in the exhibit.

The exhibit of the architectural department was chiefly arranged to show the present course of study, illustrated by examples selected from the regular work of the different classes in shop practice, drawing and designing. It consisted of the following articles: A complete series of specimens of architectural shop practice with additional examples of advanced work on stairs, roofs, cabinet work, etc.; the complete series of drawings and designs made by each student during the entire course of study, selected from the ordinary work of the classes, framed and arranged in proper sequence; numerous bound volumes with additional specimens; all the text-

books, both printed and blue printed, used in the architectural classes; the complete classification employed in the architectural cabinet of mounted plates, together with several portfolios of examples; bound volumes of students' tracings illustrating history of architecture; bound volumes containing working drawings of Military Hall and Science Hall, the designs and drawings being entirely the work of graduates and students of this department; an original chart illustrating the derivation, continuance and inter-relation of the different architectural styles; charts showing the courses of study in architecture and architectural engineering and also the numerical and relative attendance in the department since its establishment; photographic views in architectural shops and class rooms. Several instruments belonging to the College of Engineering, in addition to the exhibits of the several departments, were Thacher's computing scale, Thomas' arithmometer, Amsler's planimeter and integrator and Coradi's rolling planimeter.

The exhibit of the department of theoretical and applied mechanics comprised a full set of test specimens of the tests of materials made by the class in resistance of materials; apparatus used in tests of materials and in hydraulics, whose nature permitted exhibition; sets of students' problems and reports in analytical mechanics, resistance of materials and hydraulics, and text-books used in instruction in these branches. Among the test specimens were twenty-one tensile tests of wrought iron and steel, including both round and flat; wrought iron bolts, tensile and flexure tests of cast iron, tensile tests of aluminum; tensile compression and flexure tests of wood, and sample tests of stone. Among the instruments exhibited were the following: hook gauge, trapezoidal weir, orifice, water motor, extensometer, micrometers. Three en-

larged photographic views in the laboratory of applied mechanics and forty sets of students' problems were exhibited.

The preparation of this great exhibit required and received an immense amount of thoughtful planning and self-imposed labor on the part of the University professors and assistants, all of whom, however, cheerfully made the contribution to the successful result. A special committee of the faculty, appointed for the purpose, had a very large share in the labor and should share largely in the credit.

## ACKNOWLEDGMENTS.

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SPRINGFIELD, ILL., Jan. 6, 1894.

I beg to acknowledge having received from the Illinois Board of World's Fair Commissioners the collection of stuffed animals and minerals, Lippincott's Gazetteer and the school statistics exhibited in the Model School Room.

HENRY RAAB,  
*Supt. Pub. Instruction.*

NORMAL, ILL., Dec. 17, 1893.

Received from the Illinois Board of World's Fair Commissioners the following objects constituting the exhibit of the Illinois State Normal University at the recent Columbian Exposition:

Sixty-six pictures.

Thirty-six picture frames and glass (packed separately).

Sixteen framed maps.

Eighteen framed outlines of school work.

Two hundred and fifty pieces of clay work.

One hundred and eighty pieces of form work in paper.

Twenty-eight portfolios of drawings, picture stories and color work in grade.

Sixteen books of bound maps.

Four hundred and ninety-five books of student work in school subjects.

Sixteen framed science drawings.

Seventy-five pieces of physical and chemical apparatus.

Two hundred pieces of dissections and specimens in zoölogy and physiology.

JOHN W. COOK.

CHICAGO, ILL., May 14, 1894.

The entire exhibits (save loss in thefts, breakage, etc.,) made at the World's Columbian Exposition (Illinois Building) by the University of Illinois, whether such material was previously owned by the University or was made or purchased for the purpose at the expense of the Illinois Board of World's Fair Commissioners, were received by the University after the close of the Exposition.

In addition to the above many cases in which the exhibits were made, together with ten cases in which geological specimens were shown, were received by the University.

T. J. BURRILL,  
*Acting Regent.*

Received of the Illinois Board of World's Fair Commissioners the following articles, the same constituting the entire exhibit of the Southern Illinois State Normal University at the Illinois State Building, World's Columbian Exposition.

#### CHARTS.

##### READING.

(3 leaves). Showing work of pupils for each month of the 1st three years of school.

(3 leaves). Showing work of pupils for each month of the 4th and 5th years.

(3 leaves). Showing work of pupils for each month of the 6th and 7th years.

Reading Chart.—Representing blackboard and slate work preparatory to taking up a first reading book.

(4 leaves). 7th grade reading, 1st term. Showing work of pupils for the 2d three months.

(3 leaves). 7th grade reading, 2d term. Showing work of pupils for the 2d three months.

(4 leaves). 8th grade reading, 1st term. Showing work of pupils for the 1st three months.

#### LANGUAGE.

Language and Literature Chart.—Sample lessons from work of 1st year.

(3 leaves). Showing work of pupils for each month of the 1st three years of school.

(3 leaves). Showing work of pupils for each month of the 4th and 5th years.

(3 leaves). Showing work of pupils for each month of the 6th and 7th years.

Language Chart.—Sample lessons from work of 2d year.

(3 leaves). 7th grade language. Leaf 1 shows sample work of pupils for the 1st three months; leaf 2, for the 2d three months; and leaf 3, for the 3d three months.

(3 leaves). Language, 1st term. Showing work of pupils for the 1st three months.

(3 leaves). 8th grade grammar, 2d term. Showing work of pupils for the 2d three months.

#### NUMBER.

Number Chart.—1st year number chart.

(3 leaves). Showing work of pupils for each month of the 1st three years of school.

(2 leaves). 3d term. Showing work of pupils for the 3d three months. (Arith.)

(3 leaves). Showing work of pupils for each month of the 4th and 5th years.

(3 leaves). Showing work of pupils for each month of the 6th and 7th years.

(4 leaves). Arithmetic, 1st term. Showing work of pupils for the 1st three months.

(1 leaf). Arithmetic, 2d term. Showing work of pupils for the 2d three months.

(2 leaves). 1st term. Showing work of pupils for the 1st three months. (Arithmetic.)

(2 leaves.) 2d term. Showing work of pupils for the 2d three months. (Arithmetic.)

#### FORM AND COLOR STUDY AND DRAWING.

(4 leaves). 3d grade drawing. Showing construction, representation and decoration.

(4 leaves). A 3d grade drawing. Showing construction, representation and decoration.

Shelves. Samples of clay modeling, 1st and 2d grades, and some materials for language work. (Case 6).

(6 leaves). 4th grade drawing. Showing construction, representation and decoration.

(6 leaves). 5th grade drawing. Showing construction, representation and decoration.

(6 leaves). 6th grade drawing. Showing construction, representation and decoration.

(3 leaves). Leaves 1, 2 and 3 show work of pupils in construction for the 1st, 2d and 3d terms, respectively, 8th grade.

(3 leaves). Leaves 1, 2 and 3 show work of pupils in representation for the 1st, 2d and 3d terms, respectively, 8th grade.

(3 leaves). Leaves 1, 2 and 3 show work of pupils in decoration for the 1st, 2d and 3d terms, respectively, 8th grade.

#### GEOGRAPHY.

(3 leaves). 3d and A—3d grades geography. Showing work of pupils for each month of the 3d and 4th years.

(3 leaves). 4th and 5th grades geography. Showing work of pupils for each month of the 5th and 6th years.

(3 leaves). 6th grade history. Showing work of pupils for each month of the 7th grade.

(3 leaves). 7th grade, 1st term. Showing map and manuscript work of pupils for the first three months.

(3 leaves). 7th grade, 2d term. Showing map and manuscript work of pupils for the 2d three months.

(3 leaves). 3d term. Showing work of pupils for the 3d three months, 7th grade.

#### HISTORY.

(3 leaves). 6th grade history. Showing work of pupils for each month of the 7th year.

(3 leaves). 8th grade history, 1st term. Showing work of pupils for the first three months.

(2 leaves). 8th grade history, 2d term. Showing work of pupils for the 2d three months.

(4 leaves). 8th grade history, 3d term. Showing work of pupils for the 3d three months.

#### ELEMENTARY SCIENCE.

(3 leaves). Showing representation in water colors of home birds. (This work followed a study of the birds).

(3 leaves). Plants, 6th grade. Illustrations and descriptions drawn and colored from the objects.

Shelves. Mounted specimens of birds studied.

(1 leaf). 7th grade botany, 1st term. Showing work of pupils for the 1st three months.

(3 leaves). Physiology. Showing work of the pupils for the 1st three months, 8th grade.

(3 leaves). Zoölogy. Showing work of the pupils for the 1st three months, 8th grade.

(3 leaves). Physics. Showing work of pupils for the 1st three months, 8th grade.

### WRITING.—7th grade.

(3 leaves). 1st term. Showing work of pupils for the 1st three months.

(3 leaves). 2d term. Showing work of pupils for the 2d three months.

(3 leaves). 3d term. Showing work of pupils for the 3d three months.

### NORMAL DEPARTMENT.

#### PHYSICS, CHEMISTRY AND GEOLOGY.

(4 leaves). Drawings and manuscripts, exhibiting method used in teaching physics.

(4 leaves). Drawings and manuscripts, exhibiting method used in teaching chemistry.

(4 leaves). Drawings and manuscripts, exhibiting method used in teaching geology.

(3 leaves). Showing drawings and manuscripts, exhibiting method used in teaching chemistry.

(3 leaves). Showing drawings and manipulation of apparatus used in teaching physics.

#### ASTRONOMY.

(3 leaves). Showing sketches made by pupils of heavenly bodies while using telescopes.

(4 leaves). Showing original designs representing the solar system.

#### GEOMETRY.

(5 leaves). 1st term. Showing examination papers of pupils as written in the hour of forty-five minutes, without revision.

(3 leaves). 2d term. Showing examination papers of pupils, as written in the hour, forty-five minutes, without revision.

## DRAWING.—1st Term.

(6 leaves). Showing work of pupils in constructive free-hand drawing, objects.

(6 leaves). Showing work of pupils in decorative work free-hand drawings.

(6 leaves). Showing work of pupils' 2d term in instrumental drawing, construction from objects.

(7 leaves.) Showing work of pupils in free-hand drawing, representation from objects.

(6 leaves). Showing work of pupils in Egyptian decoration.

(7 leaves). Showing work of pupils in applied design (decoration).

(6 leaves). Showing work of pupils' 3d term in drawing from casts, representative.

(7 leaves). Showing work of pupils in representative drawing from blocks and objects.

## BOOK-KEEPING.

(6 leaves). Showing work of pupils in writing business letters.

(6 leaves). Showing specimens of account current papers.

(6 leaves). Showing work of pupils in the transaction of business.

## PENMANSHIP.

(6 leaves). Showing work of pupils in making a grand balance.

(6 leaves). Showing work of pupils in writing practical business letters.

## GEOGRAPHY.

First Term.—This case contained three charts of three leaves each, showing work of pupils in map drawing and manuscript work.

Second Term.—Two charts of four and five leaves respectively, showing work of pupils in map drawing and illustration. Physical Geography.

#### HISTORY.

(5 leaves). 2d term. Showing work of pupils in illustrating some of the interesting facts in the study of United States History.

(4 leaves). English History. Showing work of pupils in illustrating different periods in English History by means of map drawing.

Two charts containing 6 and 5 leaves respectively, showing drawings by pupils illustrating the principal facts in 1st term of United States History.

(3 leaves). 2d term. Showing map and manuscript work of pupils in civil government.

#### GRAMMAR.

(1 leaf). Showing outline of work done by pupils in the 2d term in English Grammar.

(1 leaf). Showing method of teaching abridgement.

#### GREEK AND LATIN.

(3 leaves). Greek. Showing work of pupils in 1st and 2d years of Greek.

(6 leaves). Latin. Showing map and manuscript work of class in "Cæsar."

K. Latin, 1 book.

Review Books, Virgil, 1 book.

Prosody, Virgil, 1 book.

Cæsar } 1 book.  
Sallust }

Virgil } 1 book.  
Cicero }

J. Latin, 1 book.

## MANUSCRIPT BOOKS.

## TRAINING SCHOOL.

Reading:—1st and 2d grades, 1 book; 3d and 4th grades, 1; 4th grade, 1; 5th grade, 1; 6th grade, 3; 7th grade, 1; 8th grade, 1.

Language:—1st and 2d grades, 1 book; 3d grade, 1; A-3d grade, 1; 4th grade, 1; 5th grade, 1; 7th grade, 1.

Writing:—1st, 2d and 3d grades, 1; A-3d and 4th grades, 1; 5th and 6th grades, 1; 7th grade, 1.

Drawing:—8th grade, 1 book.

Number:—1st grade, 1; 2d grade, 1; 3d grade, 1; A-3d grade, 1; 4th grade arithmetic, 1; 5th grade arithmetic, 1; 6th grade arithmetic, 1; 7th grade arithmetic.

Miscellaneous collection of work done by pupils in the geography classes ranging from 3d grade to 6th grade, 1 book; A-3d grade geography, 1 book; 7th grade 1.

History:—7th grade, 1 book; 8th grade, 1.

Botany:—7th grade, 1.

Physiology and zoölogy:—8th grade, 1 book.

Science:—6th grade 1.

Representative work from 7 grades, 1 book; 1 book in field work.

## NORMAL WORK.

C pedagogy, 1 book; B pedagogy, 1; history of education, 1; observation in training school, 2 books.

Psychology A, 1 book.

Ethics, 1 book.

Physics A, 1 book.

Astronomy, 1 book.

Botany A, 1 book; plant analysis, 1 book.

Zoölogy A, 1 book.

Physiology B, 1 book; A, 1 book.

Arithmetic B, 1 book; A, 1 book.

Algebra A, 1 book.

Geometry,

Book-keeping, 3 books.

Grammar C, 1 book; B, 1 book; A, 1 book.

Literature:—American B, 1 book; American A, 1 book;  
English B, 1 book; English A, 1 book.

Reading, 1 book.

Rhetoric, 2 books.

Geography A, 2 books; B, 1 book.

History:—B, 2 books; A, 1 book; general, 2 books;  
English, 2 books; Roman, 1 book.

Civil Government, 2 books.

Drawing:—Specimen lessons, 1 book; A, 1 book.

Writing, 2 books.

English Analysis, 1 book.

Latin, 1 book, Cæsar.

German, 1 book.

Greek, 1 book, 1st and 2d year's work.

#### HIGH SCHOOL.

Geography, 1 book.

Algebra E, 1 book; D, 1 book.

#### CASES.

Nos. 22 and 23. Sample cases from museum, showing ducks of Illinois.

No. 39. Material used in language, number, color and form study.

No. 40. Material used in the study of geography, some mounted plans and photograph album of board work done by students.

Nos. 41-52. Photographs of buildings, rooms, apparatus and students.

No. 47. Photographs of blackboard drawing and apparatus in the Science Department.

## MISCELLANEOUS.

Framed photographs of buildings, rooms, faculty, etc.

Hand-book giving history, general information and syllabus of work in the different departments.

Box of solids.

1 microscope.

71 photographs building and grounds.

26 photographs illustrating class work and apparatus.

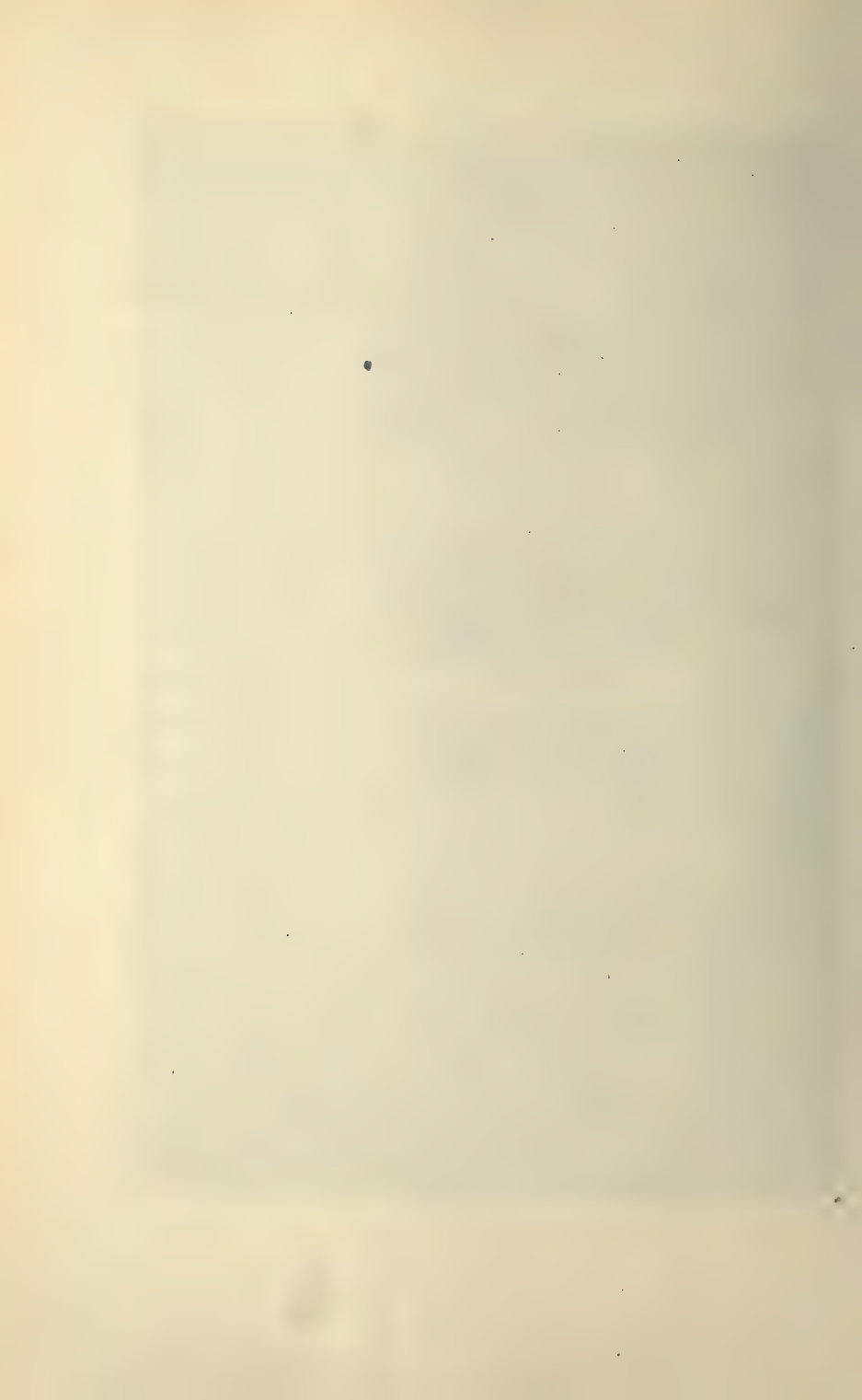
1 case of (dry) liquid measures.

1 Graphoscope.

Mounted specimens (plants.)



CHARITABLE INSTITUTIONS' EXHIBIT.





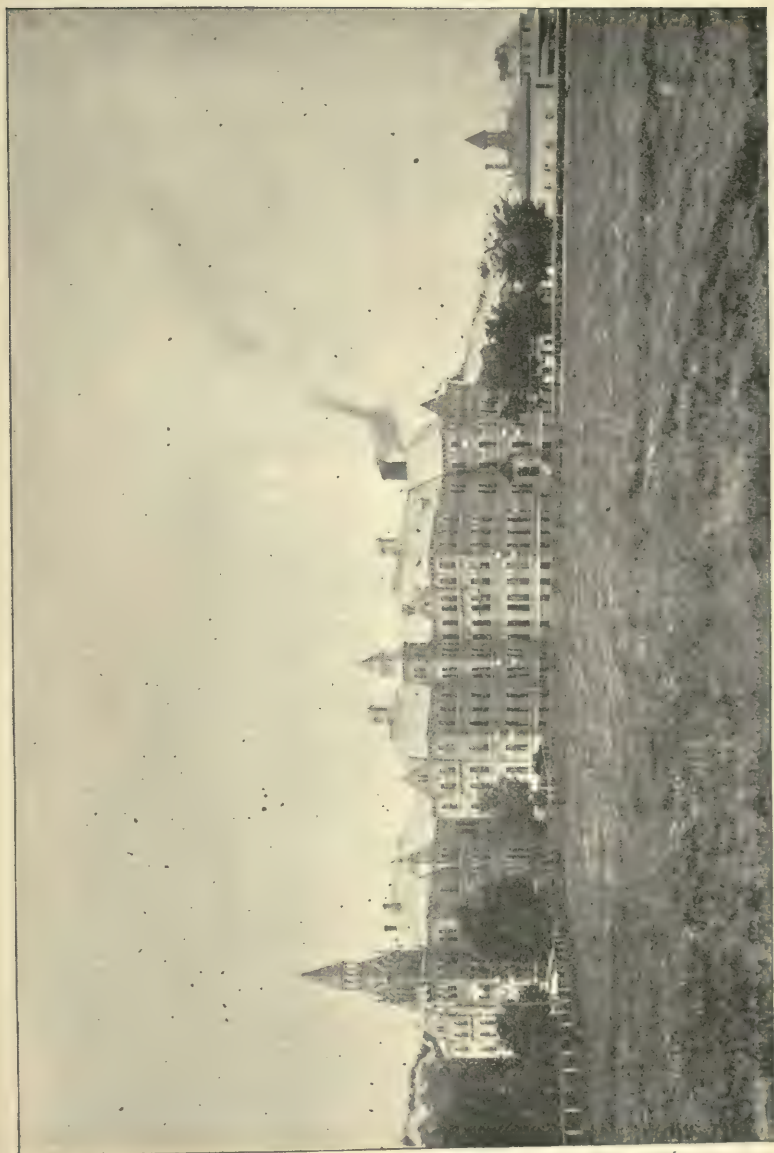
ILLINOIS SOLDIERS' AND SAILORS' ORPHANS' HOME, NORMAL.





SOLDIERS' AND SAILORS' HOME, QUINCY.



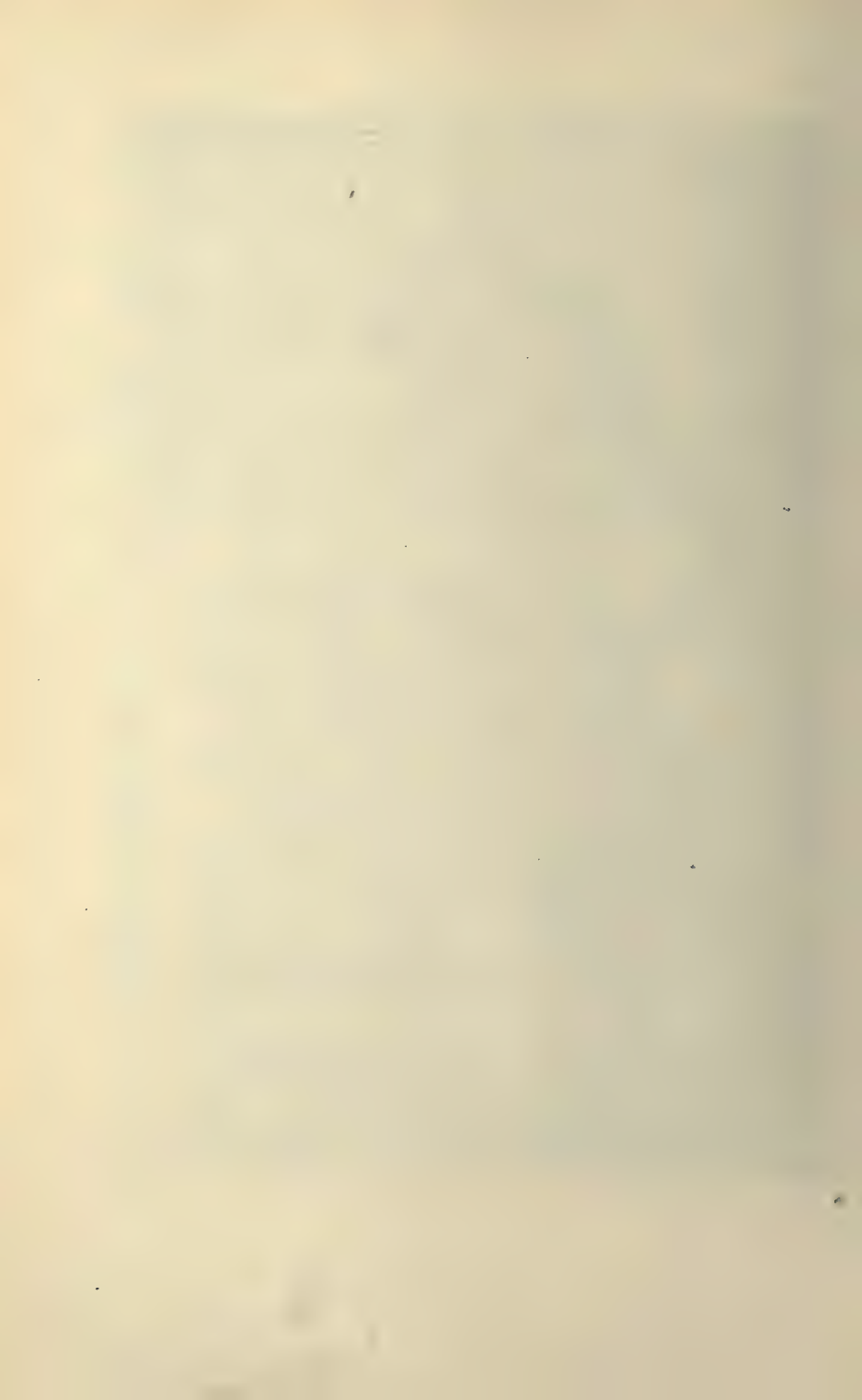


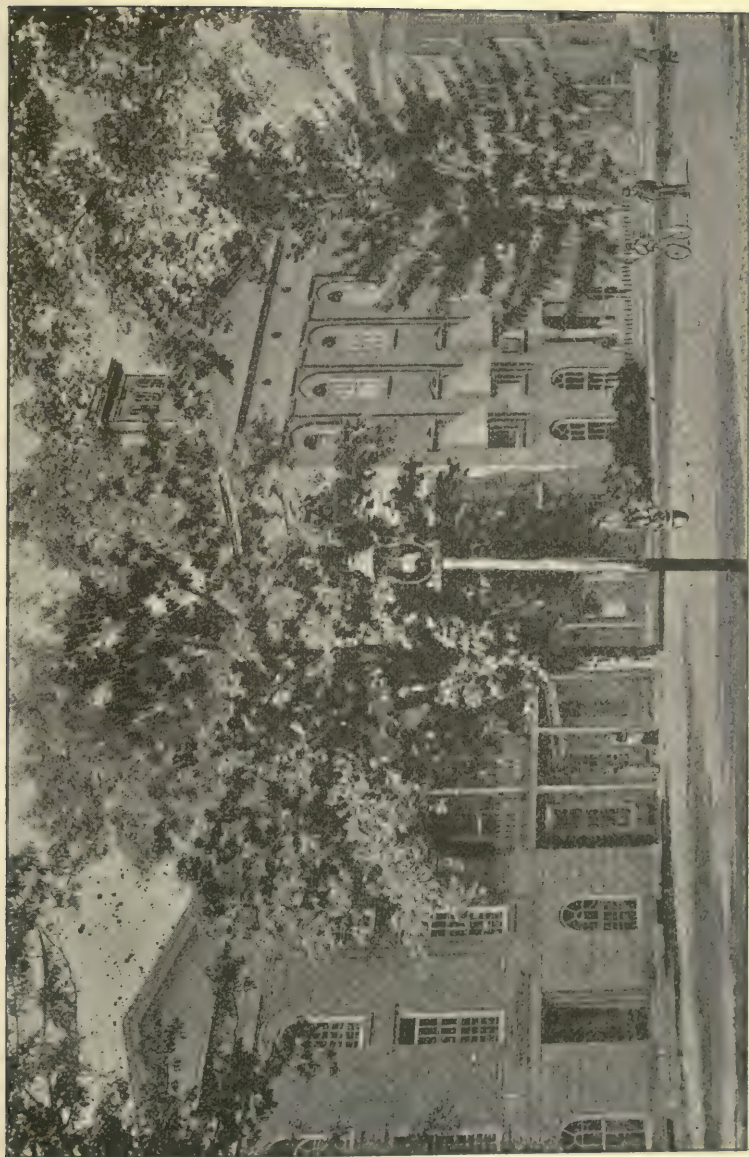
ASYLUM FOR FEEBLE MINDED, LINCOLN.





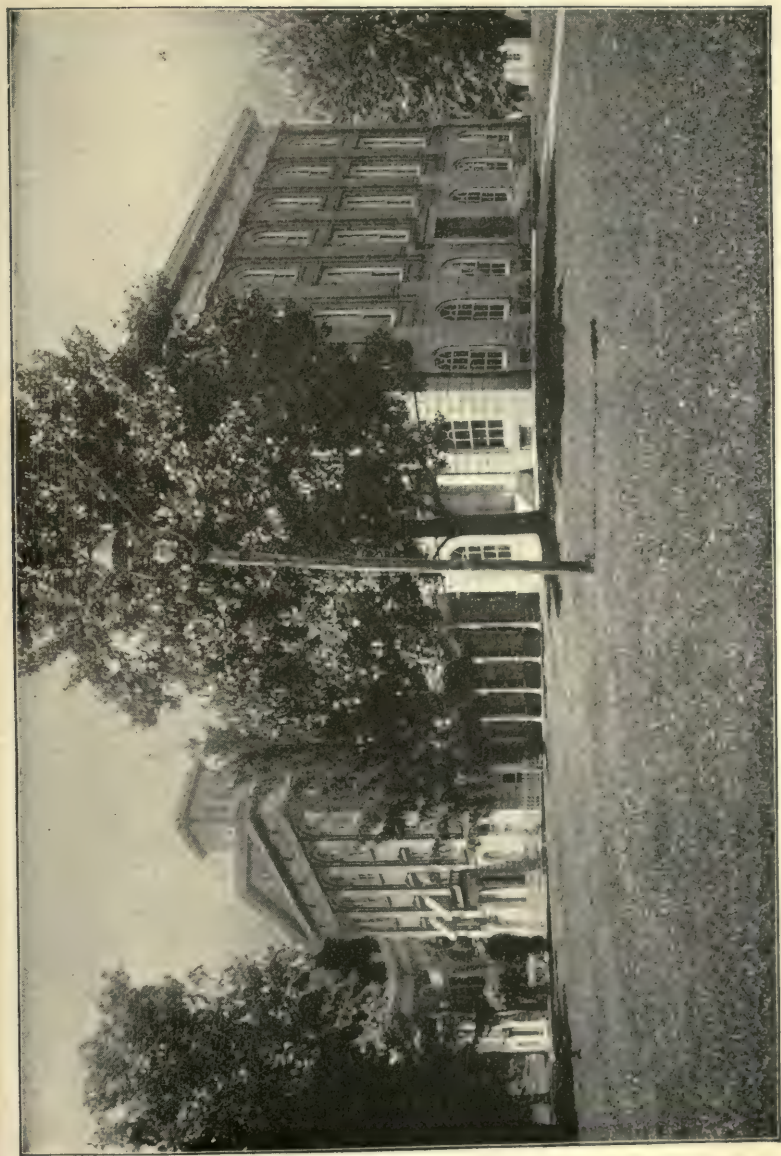
INSTITUTION FOR THE EDUCATION OF THE BLIND, JACKSONVILLE.





INSTITUTION FOR THE EDUCATION OF THE DEAF AND DUMB, JACKSONVILLE.





ILLINOIS CENTRAL HOSPITAL FOR INSANE, JACKSONVILLE.





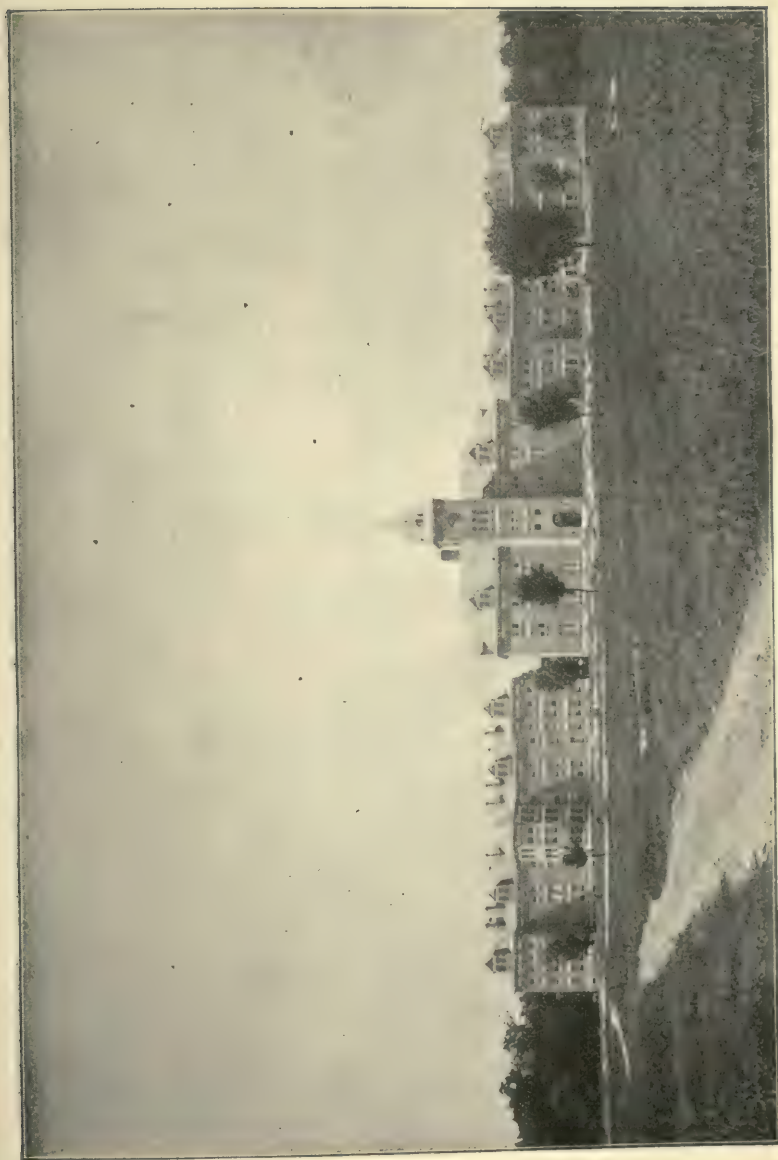
NORTHERN HOSPITAL FOR INSANE, ELGIN.





ILLINOIS SOUTHERN HOSPITAL FOR THE INSANE, ANNA.



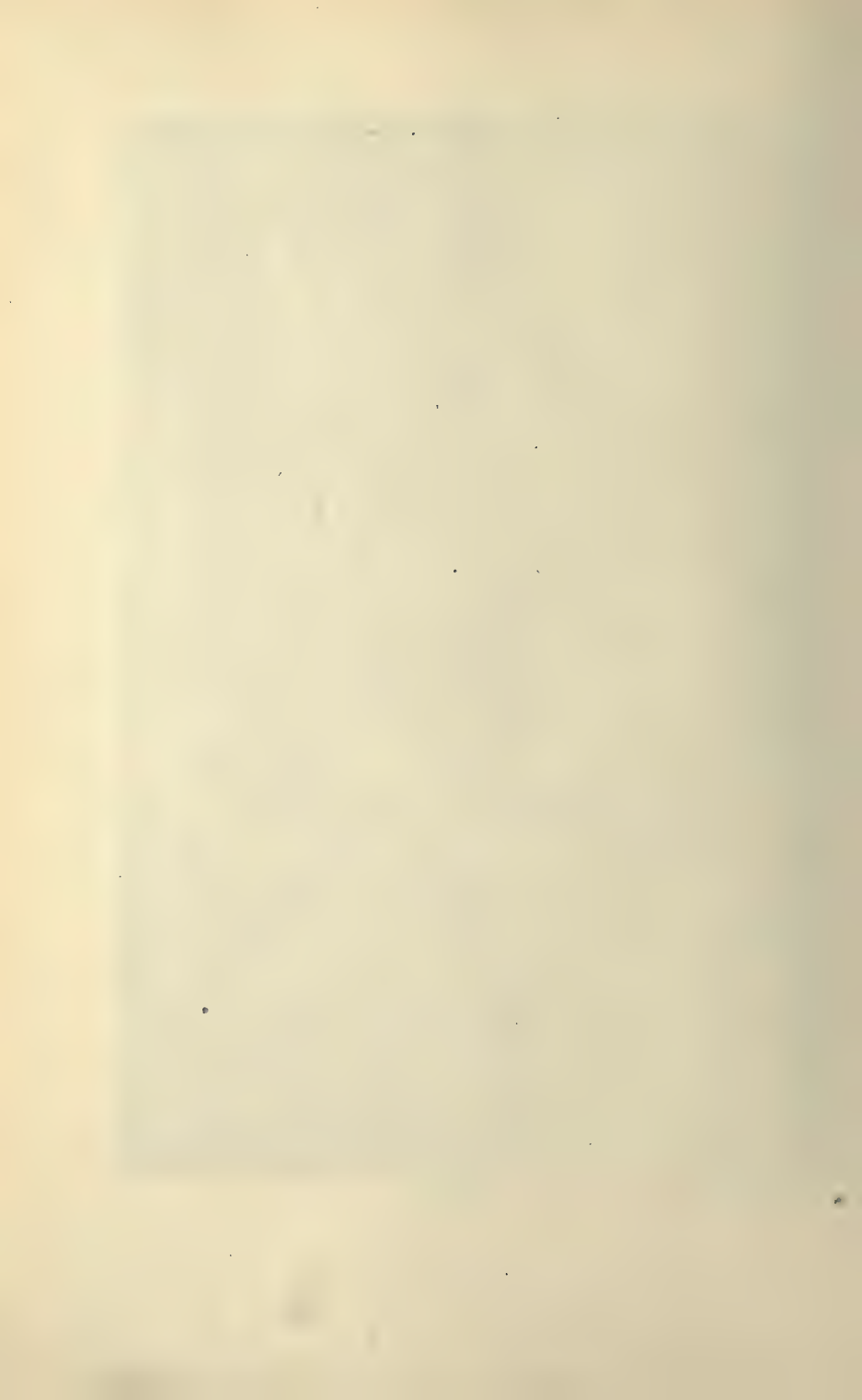


ILLINOIS SOUTHERN HOSPITAL FOR INSANE, ANNEX, ANNA.





ILLINOIS EASTERN HOSPITAL FOR INSANE, KANKAKEE.



## REPORT OF THE COMMITTEE ON STATE CHARITABLE INSTITUTIONS.

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**T**HE act creating the Illinois Board of World's Fair Commissioners, required of them, among other things, "An Exhibit of the Educational and Industrial work as conducted in the State Charitable Institutions."

Upon the organizing of your honorable body, the following members were appointed as the Committee on State Charitable Institutions, and charged with the duty of performing or securing the performance of the above statutory requirement, to-wit: James M. Washburn, A. B. Hostetter, B. F. Wyman, J. W. Judy and W. D. Stryker.

The control of the very liberal appropriation of \$800,000.00 was diminished by the sum of \$80,000.00, specially appropriated to the Woman's Board and by the further sum of \$40,000.00, devoted to the Illinois exhibits of live stock, leaving but \$620,000.00 under the control of your honorable board.

The pre-determined purpose to invest between \$250,000.00 and \$300,000.00 in the building and its furnishings and the ornamentation of its grounds, left less than \$350,000.00 with which to prepare, collect and maintain all the exhibits required by the law, to pay the salaries and expenses of the Board, and to entertain hospitably all the visitors to our Building. In order to secure equality between the various committees and economy in the expenditure of the moneys devoted to securing, preparing and maintaining exhibits, a committee was appointed to apportion the moneys to be expended, to the several

committees, and under this apportionment, the sum of \$20,000.00 was assigned to the Committee on State Charitable Institutions with which to make their exhibits.

This sum was so unsatisfactory to the Superintendent of the Institution for the Education of the Deaf and Dumb, who desired more than that sum to enable him to maintain a school of seventy-five or eighty of his pupils at the Fair to demonstrate the methods of teaching and the progress of the pupils, that he declined to make any personal exhibit. Your Committee decided that it was not desirable to have a personal exhibit from any of the Charitable Institutions except the Blind and the Deaf and Dumb. Upon a consultation with the superintendents of the several charitable institutions, and at their request, the sum of \$6,000.00 was set apart for the exhibit of the Deaf and Dumb; a like sum for the Blind, and \$1,000.00 for the exhibit of the Asylum for Feeble-Minded Children. Thereupon the Superintendent of the Institution for the Blind decided to make a personal exhibit with twelve or fifteen of his pupils. The Committee also decided to have taken and put on exhibition, photographic views of the several charitable institutions, and to have prepared and published in pamphlet form for judicious gratuitous distribution during the Fair a brief history of each of the State Charitable Institutions.

These photographs were taken in two sizes, one 18x22 inches; the other 24x36 inches, and framed with quarter sawed oak. The size of these frames, lesser frame 24x28 inches, moulding 3 inches wide, size of larger frames 30x40 inches, moulding 4 inches wide. They were tastefully suspended around the walls of the rooms occupied by the exhibits of the Charitable Institutions in the Illinois Building, prominently in view of all visitors, and attracted much attention and many compliments. There were taken and framed one hundred and forty photo-

graphs 18x22 inches and seventy-nine photographs 24x36; the frames of the former cost \$8.50 each, the latter \$11.00, besides the expenses of the artist while taking the negatives, amounting to \$170.00.

The Committee have thought these photographs (which were the only exhibits made by six out of ten State Charitable Institutions) worthy of being catalogued in this report.

#### PHOTOGRAPHIC VIEWS OF OUR STATE CHARITABLE INSTITUTIONS.

##### VIEWS TAKEN AT THE ILLINOIS CHARITABLE EYE AND EAR INFIRMARY, AT CHICAGO.

No.	View.	Size.
4545.	Operating room.....	18x22 inches
4546.	Ear dispensary room.....	18x22 "
4547.	Main sitting room.....	18x22 "
4548.	Refraction room.....	18x22 "

##### VIEWS TAKEN AT THE SOLDIERS' ORPHANS' HOME AT NORMAL, ILL.

No.	View.	Size.
3584.	School and children.....	24x36 inches
3588.	School room.....	18x22 "
3589.	Dynamos.....	18x22 "
3590.	Chapel.....	24x36 "
3591.	Dining room and children.....	18x22 "
3591½	Reception room.....	18x22 "
3592.	Kitchen.....	18x22 "
3592½	Kindergarten dormitory.....	18x22 "
3593.	Library.....	24x36 "
3593.	Clothing and repair room.....	18x22 "
3597.	Main entrance.....	24x36 "

VIEWS TAKEN AT THE SOLDIERS' AND SAILORS' HOME AT  
QUINCY, ILL.

No.	View.	Size.
00.	Group of old soldiers.....	18x22 inches
3524.	Chapel.....	18x22 "
3525.	Boiler room.....	18x22 "
3526.	Old men's dormitory.....	18x22 "
3527.	Upper hospital ward.....	18x22 "
3528.	Reading room.....	18x22 "
3529.	Kitchen.....	18x22 "
3530.	Amusement room.....	18x22 "
3531.	Laundry.....	18x22 "
3533.	Quartermaster's store room.....	18x22 "
3534.	Guests' chamber.....	18x22 "
3535.	Grounds and flower beds.....	24x36 "
3536.	Battery.....	24x36 "
3537.	Farm buildings.....	24x36 "
3538.	Superintendent's office.....	18x22 "
3539.	Cow barn.....	24x36 "
3540.	Trustee's room.....	18x22 "
3541.	Sitting room.....	18x22 "
3543.	Old men's dining room.....	24x36 "
3548.	Bird's eye view of street of cottages..	24x36 "

VIEWS TAKEN AT THE ASYLUM FOR FEEBLE-MINDED  
CHILDREN AT LINCOLN, ILL.

No.	View.	Size.
3560.	Tailoring room.....	18x22 inches
3561.	Main entrance.....	18x22 "
3562.	Amusement hall.....	18x22 "
3563.	Dormitory, asylum department.....	18x22 "
3564.	Day room, asylum department.....	18x22 "
3565.	Laundry.....	18x22 "
3566.	Dormitory.....	18x22 "

*Asylum for Feeble Minded Children—Concluded.*

No.	View.	Size.
3567.	Gymnasium .....	18x22 inches
3571.	Dynamo room.....	18x22 "
3574.	Reception room.....	24x36 "
3575.	Main kitchen .....	24x36 "
3576.	Dormitory .....	18x22 "
3577.	Infirmary ward, asylum department.	18x22 "
3578.	Dining room annex.....	18x22 "
3579.	Kindergarten school.....	18x22 "
3580.	Main dining room.....	24x36 "
3581.	Lace workers.....	18x22 "
3582.	Emergency hospital room.....	18x22 "
3583.	Sewing room, south wing.....	18x22 "
3584.	Wood carving room .....	18x22 "
3585.	Ironing room .....	18x22 "
3586.	General office.....	18x22 "
3587.	Boiler room.....	24x36 "
3588.	Band room.....	18x22 "

VIEWS TAKEN AT THE INSTITUTION FOR THE BLIND  
AT JACKSONVILLE, ILL.

No.	View.	Size.
4395.	Bowling alley .....	18x22 inches
4396.	Chapel with pupils .....	18x22 "
4397.	Dining hall.....	18x22 "
4398.	Dormitory, 1 of 16.....	18x22 "
4399.	Girls' cottage .....	18x22 "
4400.	Band wagon and hospital.....	18x22 "
4401.	Military companies .....	18x22 "
4402.	Orchestra.....	18x22 "
4405.	Chapel, front view.....	18x22 "
4406.	Main hall, main building.....	18x22 "

*Institution for the Blind—Concluded.*

No.	View.	Size.
4407.	Store room, broom dept.....	24x36 inches
4408.	Printing room.....	24x36 "
4409.	Sitting room, men's dormitory.....	24x36 "
4410.	High school.....	24x36 "
4412.	Kindergarten.....	24x36 "
4413.	Sewing room.....	24x36 "
4414.	Main hall, girls' cottage.....	24x36 "
4415.	Hospital, girls' ward.....	24x36 "
4416.	Type writing room.....	24x36 "
4417.	Broom shop, sewing room.....	24x36 "
4418.	Kitchen.....	24x36 "
4419.	Broom shop, tying room.....	24x36 "
4420.	Bakery.....	24x36 "

At the Institution for the Deaf and Dumb at Jacksonville, there were sixty-four photographic views taken (thirty at the instance of your Committee and thirty-four at the instance of Dr. Gillett). Of these, thirty were selected and framed as follows, the remainder put on stretchers:

No.	View.	Size.
4191.	Dairy herd.....	24x36 inches
4197.	Girls going to school.....	24x36 "
4200.	School room, 1 of 28.....	24x36 "
4201.	Boys' class, Alma Gillette.....	24x36 "
4204.	Articulating class, Lyde Kent.....	18x22 "
4209.	Front view of main building.....	24x36 "
4213.	Garden walk, etc.....	24x36 "
4216.	Girls' gymnasium class with poles...24x36	"
4218.	Articulation class, Grace Higgins....18x22	"
4220.	Store room of cabinet shop.....	18x22 "
4221.	School building and grounds.....	24x36 "
4223.	Articulating class, Jane Russell.....18x22	"
4224.	Cadets: Stack arms.....	24x36 "

*Institution for the Deaf and Dumb—Concluded.*

No.	View.	Size.
4225.	Articulating class, Alma Gillett.....	18x22 inches
4226.	“ “ .....	18x22 “
4228.	Swinging room and class.....	18x22 “
4229.	Little girls at play.....	24x36 “
4232.	Articulation class (2d year), Mary Halder.....	18x22 “
4237.	General store, counting room, etc....	18x22 “
4243.	Shoe shop.....	18x22 “
4247.	Girls' gymnasium with dumb bells ..	18x22 “
4248.	Cabinet shops.....	18x22 “
4249.	Chapel with pupils, 520.....	18x22 “
4250.	Printing office.....	18x22 “
4261.	Class No. 1, sign department.....	18x22 “
4263.	Garden view—boys at work .....	18x22 “
4264.	Art room and drawing class.....	18x22 “
4265.	Articulation class, Helen Waite.....	18x22 “
4268.	Articulation class, Jane Gillette.....	18x22 “
4292.	Back view of store, library, bakery, cold storage, kitchen, boiler house, etc.....	24x36 “

PHOTOGRAPHS TAKEN AT THE CENTRAL HOSPITAL  
FOR INSANE AT JACKSONVILLE, ILL.

No.	View.	Size.
3620.	Trustees' room, main building.....	18x22 inches
3621.	Associate dormitory—annex building.....	18x22 “
3622.	Dining room, 1 of 24.....	18x22 “
3623.	View of grounds.....	24x36 “
3624.	Laundry, ironing room.....	24x36 “
3625.	Swimming pool.....	24x36 “
3626.	Offices in main building.....	18x22 “
3627.	Patient's bed room, 1 of 300.....	18x22 “
3628.	Ward No. 7, main building.....	18x22 “

*Central Hospital for Insane—Concluded.*

No.	View.	Size.
3629.	Kitchen in annex.....	24x36 inches
3630.	Farm building.....	24x36 "
3632.	Grounds and main building.....	24x36 "
3633.	Reservoir.....	24x36 "
3634.	Engine room.....	24x36 "
3635.	Associate dining room in annex.....	24x36 "
3636.	Alcove in ward 7, main building.....	18x22 "
3637.	Cross ward, main building.....	24x36 "
3638.	Machine and repair shop.....	24x36 "
3639.	Sitting room in main building.....	18x22 "
3640.	Chapel in main building.....	18x22 "
3641.	Amusement hall, seats 400.....	18x22 "
3642.	Amusement hall annex, seats 530...18x22	"
3643.	Laundry and wash room.....	18x22 "
3644.	Officers and employés.....	18x22 "
3645.	Alcove and ward in annex.....	18x22 "
3646.	Chapel in annex, seats 530.....	18x22 "
3647.	Bird's eye view to westward.....	18x22 "
3658.	Bird's eye view, includes reservoir.....	24x36 "
3659.	Bird's eye view of annex building....	24x36 "
3661.	Band.....	24x36 "

PHOTOGRAPHS TAKEN AT NORTHERN HOSPITAL FOR  
INSANE AT ELGIN, ILL.

No.	View.	Size.
3294.	Superintendent's office.....	18x22 inches
3295.	Associate dining hall.....	24x36 "
3296.	Associate dining hall, alcove and conservatory.....	24x36 "
3298.	Boiler room.....	24x36 "
3299.	Dormitory in annex.....	18x22 "
3300.	Officers and employés.....	18x22 "
3301.	Engine and dynamo room.....	18x22 "

*Northern Hospital for Insane—Concluded.*

No.	View.	Size.
3302.	Associate dining hall, male patients..	18x22 inches
3303.	Ward A, 2d floor, male patients' hall.	18x22 "
3304.	Conservatory.....	18x22 "
3305.	Main entrance and stairway, center building .....	18x22 "
3306.	Chapel in center building.....	18x22 "
3307.	Disturbed ward D, male patients.....	18x22 "
3308.	Superintendent's hall, center building	18x22 "
3309.	Alcove and hall, ward A .....	18x22 "
3310.	Associate dining hall, female patients	18x22 "
3311.	Lake and summer house.....	24x36 "
3312.	Tennis grounds .....	18x22 "
3313.	Disturbed ward C, female patients..	24x36 "
3314.	Disturbed ward south, annex building	24x36 "
3316.	Croquet grounds .....	18x22 "
3318.	Summer house.....	24x36 "

PHOTOGRAPHS TAKEN AT THE SOUTHERN HOSPITAL FOR  
INSANE AT ANNA, ILL.

No.	View.	Size.
3660.	Ward A-1, north wing, male patients.	18x22 inches
3661.	Disturbed ward E-3, south wing .....	18x22 "
3662.	Main hall-way in center building.....	18x22 "
3663.	Ward No. 3 and alcove.....	18x22 "
3664.	Amusement hall, center building.....	18x22 "
3665.	Laundry room.....	18x22 "
3666.	Cottage ward .....	18x22 "
3667.	Bird's eye view of lawn front, main building .....	18x22 "
3668.	Ward E-1, south wing.....	18x22 "
3669.	Bird's eye view, annex building.....	24x36 "
3670.	Bird's eye view, annex southeast.....	18x22 "
3671.	Farm buildings .....	24x36 "
3672.	Main building from north .....	24x36 "

*Southern Hospital for Insane—Concluded.*

No.,	View.	Size.
3673.	Dining room, main building.....	18x22 inches
3674.	Alcove in north wing, main building..	24x36 "
3675.	Kitchen in annex.....	24x36 "
3676.	Superintendent's office, main build- ing.....	18x22 "
3677.	Clothes room in annex.....	18x22 "
3678.	Dining room in annex.....	24x36 "
3679.	Dining room in disturbed ward.....	18x22 "
3680.	Hall-way on 2d floor, main building.	24x36 "
3681.	Boiler room in annex.....	18x22 "
3682.	Ward in main building.....	18x22 "
3683.	Ward 4 in annex, females.....	24x36 "
3684.	Ironing room.....	18x22 "
3685.	Dynamo room.....	18x22 "
3685½.	Hall way in annex.....	18x22 "
3686.	Dormitory in ward 3.....	24x36 "
3687.	Physician's office, annex.....	18x22 "
3689½.	Billiard room, ward A, 1.....	24x36 "

PHOTOGRAPHS TAKEN AT THE EASTERN HOSPITAL  
FOR INSANE AT KANKAKEE.

No.	View.	Size.
3500.	Cottage dining room.....	18x22 inches
3501.	Fire department.....	18x22 "
3502.	Ladies' ward, room 2 north.....	24x36 "
3503.	Main dining room.....	24x36 "
3504.	Business manager's office.....	18x22 "
3505.	Supply clerk's office.....	18x22 "
3506.	Sitting room.....	24x36 "
3507.	Mattress and rug room.....	24x36 "
3508.	Laboratory.....	24x36 "
3509.	Bakery.....	18x22 "
3510.	Water tower and engine house.....	18x22 "
3511.	Kitchen.....	24x36 "

*Eastern Hospital for Insane—Concluded.*

No.	View.	Size.
3512.	Printing and shoe room.....	18x22 inches
3513.	Boiler room.....	24x36 "
3514.	Cottage sitting room.....	18x22 "
3515.	Carpenter shop.....	18x22 "
3516.	Dormitory.....	24x36 "
3517.	Waterworks, pumps, fire engine.....	18x22 "
3518.	Laundry room, washing machines...	24x36 "
3519.	Soap factory.....	18x22 "
3520.	Machine shop.....	24x36 "
3521.	Slaughter and packing house.....	18x22 "
3522.	Cottage infirmary.....	18x22 "
3523.	Associate dining room.....	18x22 "
3532.	Amusement hall.....	18x22 "

In all, there seem to be one hundred and forty photographs 18x22 inches, framed 24x28 inches; and seventy-nine photographs 24x36 inches, framed 30x40 inches; total, two hundred and nineteen photographs framed, and thirty-four photographs on stretchers, not framed.

Another highly interesting and important exhibit made by each of the State Charitable Institutions was a brief history (largely statistical) of each institution, prepared by the Superintendent thereof, which your Committee had printed in pamphlet form and illustrated with a number of photographic views taken at the several institutions for judicious free distribution during the Exposition to the visitors most interested in the work of charitable institutions.

Of these histories 10,000 copies of the history of the Institution for the Blind; 8,000 copies of the history of the Institution for the Deaf and Dumb; and 5,000 copies of the history of each of the other State Charitable Institutions were printed and most of them distributed during the Exposition by those in superintendence of the exhibits of these institutions.

Copies of those histories were bound in more permanent form and distributed as follows:

- One copy to the office of each county clerk in the State,
- One copy to each of the State officers,
- One copy to each State Charitable Institution,
- One copy to each member of this Commission and to its secretary.

The cost of making and framing and hanging the photographs taken at the State Charitable Institutions, including the supervision and assistance of members of this Committee, was approximately the sum of \$3,000.00, and the cost of the histories of the several Institutions was approximately \$1,000.00.

These photographs and histories were the only exhibits made by the Soldiers' and Sailors' Home; the Soldiers' Orphans' Home; the Eye and Ear Infirmary, and the Hospitals for Insane, except the Northern Hospital at Elgin.

This Institution made a most beautiful and interesting exhibit of fine art and handiwork (made by the patients) consisting of eighteen oil paintings, chiefly of various kinds of flowers, book-marks, handkerchiefs, glove-boxes; twenty-one specimens of fine needlework of various articles, including pin-cushions, chair tidies, photograph holders, handkerchiefs, mats, etc., and thirty specimens of crochet-work of different articles, including sofa-pillows, paper-holders, ladies' aprons and skirts, chair tidies, and about one dozen bunches of lace.

#### EXHIBIT OF THE ASYLUM FOR FEEBLE-MINDED CHILDREN.

The Asylum for Feeble-Minded Children made a most wonderful, extensive and varied exhibit, consisting of forty-five specimens of hand carved wood-work. Among the more prominent of these, and worthy of special mention are two large door shutters, one mantel, one book-

case, a what-not and a settee or sofa, and a large number of picture frames, thirteen pieces of hammered brass work, six oil paintings, thirty specimens of paper and needlework of different articles, thirty-nine specimens of lace, embroidery and crochet work of various articles, fifteen specimens of needlework on various articles of dress, pillows, rugs and mats, boots, and seven pairs of shoes.

EXHIBIT MADE BY THE INSTITUTION FOR THE DEAF  
AND DUMB.

As described by the Superintendent, Prof. S. T. Walker:

First, the school represented by complete sets of lesson papers from each class bound in attractive volumes. Second, the art department was represented by a large number of pictures, the work of our students in this department, including pen and ink work in black and white, water color and oil work, one piece being a very creditable oil painting of Rev. Thomas Gallaudet, the founder of deaf education in America.

The industrial department of this Institution which is co-important, was represented by several pieces of furniture from the cabinet shop, including a bedstead, dresser, wash-stand, book-case, office desks and a very elaborately carved sideboard. The furniture was the work of the pupils. The carving on the sideboard was the work of the art pupils. There was also a carved chair, carved bench and carved easel. The shoe shop was represented by several pairs of both men's and women's shoes, the work of pupils in this department, and the printing office was represented by bound volumes of the weekly paper published at the Institution called *The Deaf Mute Advance*, and by a large album of samples of job printing done in the office by pupils; also a very handsome illustrated twenty-eight page prospectus of the school printed in the printing office.

The room set aside for the exhibition was also embellished by very large sized photographs of the building and grounds of the Institution. And what attracted most of the public attention was the photographs illustrating the methods of teaching the dumb to talk.

#### EXHIBIT MADE BY THE INSTITUTION FOR THE BLIND,

As described by Frank H. Hall, Superintendent of the Institution and of the exhibit prior to the 1st of July, 1893.

Machinery and type for printing embossed characters; operated by a blind boy; thousands of slips printed for free distribution.

Machinery for making brooms; operated by a blind man; hundreds of whisk brooms made and sold at 10 cents each.

Sewing machines; operated by a blind girl; a great variety of articles made and sold as souvenirs.

Remington typewriter; operated by a blind boy; wrote large numbers of slips for free distribution, and occasionally wrote letters from dictation for pay.

The Braille-writer; operated sometimes by a blind boy, at other times by a blind girl; slips prepared for free distribution.

The stereotype-maker; operated by a blind man; from six to ten pages of copper stereotypes of standard music prepared each day. These plates are now the property of the Illinois Institution for the Blind, and from them music is printed for use in the school.

The "New York Point Slate" was in constant use by the side of the "Illinois Braille-writer," thus bringing the old and the new into striking contrast.

Several girls were employed in making bead work, in crocheting, knitting, hammock making, etc.

One or two pupils were kept constantly busy illustrating the method of reading by touch.

At stated intervals music was provided; a piano, cornet, violin, violoncello, clarinet, euphonium and trombone being the principal instruments used.

A great variety of work from the shops and sewing rooms of the Institution was also on exhibition.

Twenty-two blind persons took part in the exhibition, the usual number present at any one time being thirteen.

LIST OF ARTICLES MADE BY THE BLIND AND EXHIBITED  
IN THE ILLINOIS BUILDING.

Shop-work.—Brooms of all kinds, caned chairs.

Needle-work.—Aprons, handkerchiefs, dress, bed quilt, embroidered doylies.

Knitting and Crochet.—Pillow sham, laces, mats, head-rests, carriage afghan, cushions, dressed dolls, capes, fascinators, shawls, skirts, mittens, holders.

Netting.—Hammocks, horse nets, throws, bead work, rope table, paper and cloth flowers.

Machinery and Appliances.—Sewing machine, Remington typewriter, Braille-writer, stereotype maker, Braille and New York point slates, printing press, books and music in embossed characters, broom machine, map of Jackson Park. Thirteen pupils at work in the foregoing.

The personal exhibit made of twelve to fifteen of the students of the Institution for the Education of the Blind under the direct supervision of Prof. Frank H. Hall, Superintendent of that Institution, and of his successor in office, Dr. W. F. Short, was by far the most interesting and attractive of all the exhibits made by the State Charitable Institutions and one of the most attractive made in the Illinois State Building.

And this Committee desires to pay the tribute of their high regard and admiration of the consummate ability and fidelity of Prof. Hall in organizing and superintending this personal exhibit, and especially to the equani-

mity and good humor shown by him under his retirement from the position of Superintendent, which in no wise dampened or diminished his energy in making his exhibit a grand success, and which was in marked contrast with the conduct of the superintendents of two or three of the other institutions, under this discouraging ordeal.

And this Committee would come short of its duty did it fail to express its disapprobation of the withdrawal of this most interesting and attractive personal exhibit by the Trustees of that Institution soon after the attendance at the Exposition had grown to very large proportions. For this unfortunate withdrawal, we believe that the Superintendent, Dr. Short, was in no wise responsible.

This Committee may be excused for congratulating itself and the Commission and the State Charitable Institutions upon the general success of the exhibits made by them, and especially upon the fact that this exhibit was made at an expenditure of less than half the amount of money apportioned to them for making it, and that of the \$20,000 apportioned for this purpose, more than half, nearly three-fifths, yet remain in the State treasury.

Respectively submitted,

JAMES M. WASHBURN, Chairman;

A. B. HOSTETTER,

B. F. WYMAN,

W. D. STRYKER.

*Committee.*

## REPORT OF COMMITTEE ON LIVE STOCK.

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**B**Y virtue of Division (f) of Section 2 of "An act to provide for the participation of the State of Illinois in the World's Columbian Exposition, etc.," it is provided that "Five per cent. of the amount appropriated by this act shall be devoted to the encouragement of an exhibit of the live stock owned in the State of Illinois."

In the organization of the Illinois Board of World's Fair Commissioners, to carry out the mandate of the Legislature in this respect, a committee on "Live Stock Exhibit" was appointed, consisting of Messrs. Fulkerson, Chairman; Chester, Virgin, Wyman and Johns.

On December 3, 1891, the Committee called a meeting at Springfield, Illinois, to which were invited "all persons interested in the exhibit of Illinois live stock at the World's Fair," together with a delegate representative from each of the different live stock associations of the State, to consider the most satisfactory method of making and managing the exhibit and disbursing the appropriation.

After full consideration of the subject at the meeting above referred to, and at subsequent conferences, the following schedule and rules, adopted by the Committee and approved by the Board, were published:

*To the Live Stock Exhibitors of the State of Illinois:*

The Illinois Board of World's Fair Commissioners have made the following rules and schedule for the distribution of the sum set apart by the Act of June 17, 1891, for the encouragement of an exhibit of live stock owned in the State of Illinois and exhibited at the World's Columbian Exposition.

First. The freight charges will be paid on all horses, cattle (including cows in the Dairy School), swine and sheep from all points in Illinois.

Second. The express charges will be paid on poultry from all parts of Illinois.

Third. Receipted bills of lading only will be accepted as evidence of charges paid.

Fourth. After the payment of charges as provided for in rules 1, 2 and 3, the balance of the appropriation so set apart for the encouragement of live stock exhibit for the State of Illinois will be divided as follows:

To horses, 37 per cent.,

To cattle, 30 per cent.,

To swine, 15 per cent.,

To sheep, 12 per cent.,

To poultry, 6 per cent.,

A catalogue of the exhibits made and by whom, also an itemized statement of disbursements to exhibitors, is hereunto appended.

Respectfully submitted,

W. H. FULKERSON,

*Chairman.*

#### BALANCE SHEET.

Dr.

To amount State appropriation.....\$40,000 00

Cr.

By amount charged administra-	
tion.....	\$3,000 00
By amount freight on live stock.	3,308 78
By amount horses, 37%.....	12,404 29
By amount cattle, 30%.....	10,106 17
By amount hogs, 15%.....	5,053 09
By amount sheep, 12%.....	4,042 47
By amount poultry, 6%.....	2,021 23
Balance on hand.....	3 97

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\$40,000 00—\$40,000.00

## EXHIBIT OF LIVE STOCK.

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### Division A.—Cattle.

#### CLASS I.—SHORT-HORN.

##### SECTION 1.

J. H. Potts & Son, Jacksonville..Thistlewood.....

##### SECTION 2.

J. H. Potts & Son, Jacksonville.....

L. W. Brown & Son, New Berlin.....

“ “ Yeodor's Mazurka.....

Green Bros., Indianola.....

O. W. Fisher, Assumption.....Mary's Waterloo Earl..

##### SECTION 3.

J. H. Potts & Son, Jacksonville..Lavender King.....

L. W. Brown & Son, New Berlin..King Richard.....

Green Bros, Indianola.....

##### SECTION 4.

J. H. Potts & Son, Jacksonville..Lavender King 6th.....

L. W. Brown & Son, New Berlin..Gold Dust.....

J. D. Varner, Indianola.....Red Knight.....

“ “ .....Columbus (not shown).

O. W. Fisher, Assumption.....Clear-the-Way.....

T. W. Hunt, Ashton.....Springing Star.....

## SECTION 5.

J. H. Potts & Son, Jacksonville..	Sempstress of Oakland 5th.....
“ “	.....
L. W. Brown & Son, New Berlin..	Account of Maplewood 16th Nelly Bly of River- dale.....
“ “	.....
Green Bros., Indianola.....	Scottish Lady .....
“ “	.....
O. W. Fisher, Assumption.....	Lovely Pride.....
“ “	.....17th Scottish Lady .....

## SECTION 6.

J. H. Potts & Son, Jacksonville .....	
“ “	Fannie Airdrie 25th.....
L. W. Brown & Son, New Berlin..	Fannie Oxford 4th.....
Green Bros., Indianola.....	Sharoness of Maple Grove 3d.....
O. W. Fisher, Assumption.....	Rose Montroth 4th .....
“ “	.....Jessie Hopewell .....

## SECTION 7.

J. H. Potts & Son, Jacksonville .....	
“ “	Caroline of Oakland 6th
L. W. Brown & Son, New Berlin..	Marguerite 5th .....
Green Bros., Indianola.....	Easter Day of Maple Grove 3d.....
“ “	.....Lucille 5th.....
O. W. Fisher, Assumption .....	Glen Ytban 5th (not shown).....
“ “	.....Maid of Atta 2d.....
T. W. Hunt, Ashton.....	

## SECTION 8.

J. H. Potts & Son, Jacksonville.....	
“ “ Fannie Airdrie 35th.....	
L. W. Brown & Son, New Berlin..	Lady Mason of Berlin
	10th.....
“ “	2d Cordelia of Maple-
	wood (not shown)....
Green Bros., Indianola.....	Young Mary of Maple
	Grove 4th.....
J. D. Varner, “ .....	Claribelle.....
“ “ .....	
O. W. Fisher, Assumption.....	Ruth.....
T. W. Hunt, Ashton.....	

## SECTION 9.

J. H. Potts & Son, Jacksonville.....	
“ “ .....	
“ “ .....	
“ “ .....	
“ “ .....	
L. W. Brown & Son, New Berlin..	Young Marshall.....
“ “	Acomb of Maplewood..
“ “	Fannie Oxford 4th.....
“ “ .....	
“ “ .....	
Green Bros., Indianola.....	
“ “ .....	Scottish Lady 18th.....
“ “ .....	Sharoneess of Maple
	Grove.....
“ “ .....	Luella 5th .....
“ “ .....	

## SECTION 10.

J. H. Potts & Son, Jacksonville..	Lavender King 4th.....
“	“ .....
“	“ .....
“	“ Sanspareil of Oakland 6th.....
“	“ Emma 13th.....
Green Bros., Indianola.....	.....
“	“ .....Easter Day of Maple Grove 2d .....
“	“ .....
“	“ .....Young Mary of Maple Grove 3d .....
“	“ .....Sharoneess of Maple Grove 5th.....
J. D. Varner, “	.....
“	“ .....Red Princess.....
“	“ .....
“	“ .....New Year's Gift.....
“	“ .....Isabelle .....
O. W. Fisher, Assumption .....	(not shown).....

## SECTION 11.

J. H. Potts & Son, Jacksonville..	King of Aberdeen.....
“	“ Chancellor.....
“	“ Emma 11th.....
“	“ Surprise of Oakland 3d
“	“ Surprise of Oakland 4th
L. W. Brown & Son, New Berlin....	(not shown).....
Green Bros., Indianola.....	Royal Britton .....
“	“ .....Royal Phillis 3d.....
“	“ .....Royal Consul 2d .....
“	“ .....Roulette.....

Green Bros., Indianola.....	Sharoness of Maple Grove 2d .....
J. D. Varner, Indianola.....	(not shown).....
T. W. Hunt, Ashton.....	“ .....

## SECTION 12.

J. H. Potts & Son, Jacksonville..	Emma 7th.....
“	“ .....
“	“ Emma 14th.....
“	“ Surprise .....
“	“ .....
“	“ .....
T. W. Hunt, Ashton.....	Hattie Bell .....
“	“ Beautiful Bell .....
“	“ Silver Flower.....
(Sweepstakes animals shown in above sections.)	

## CLASS II.—HEREFORD.

## SECTION 1.

Thos. Clark, Beecher .....	Sanhedrim .....
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## SECTION 2.

H. J. Fluck, Goodenow.....	Sitting Bull .....
Todd Benjamin, Sugar Grove.....	Wilton Grove.....

## SECTION 3.

Thos. Clark, Beecher .....	Lars.....
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## SECTION 4.

H. J. Fluck, Goodenow.....	Monitor F .....
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## SECTION 5.

Thos. Clark, Beecher .....	Bess .....
“	“ Plum.....

## SECTION 6.

Thos. Clark, Beecher .....Jingle.....

## SECTION 7.

H. J. Fluck, Goodenow.....Sarah Bernhardt.....

Thos. Clark, Beecher .....Evergreen Fairy.....

“ “ .....Juvenile .....

## SECTION 8.

Thos. Clark, Beecher .....Beauty.....

“ “ .....Sunflower 2d .....

## SECTION 9.

Thos. Clark, Beecher .....

“ “ .....

“ “ .....

“ “ .....

“ “ .....

## SECTION 10.

Thos. Clark, Beecher .....(not shown).....

## SECTION 11.

Thos. Clark, Beecher .....Peerless Wilton .....

“ “ .....

“ “ .....

“ “ .....

“ “ .....

## SECTION 12.

Thos. Clark. Beecher .....(not shown).....

(Sweepstakes same as above shown).

## CLASS III.—ABERDEEN-ANGUS.

## SECTION 1.

B. R. Pierce, Creston.....(not shown).....

## SECTION 2.

J. J. Rodgers, Abingdon.....Young Wellington.....

## SECTION 3.

J. J. Rodgers, Abingdon.....Columbian Prince.....

## SECTION 4.

B. R. Pierce, Creston.....Blackbird June.....

## SECTION 5.

B. R. Pierce, Creston.....Heather Bloom.....

“ “ .....Bell of Cottage Grove..

J. J. Rodgers, Abingdon.....Myrtle Pride.....

## SECTION 6.

B. R. Pierce, Creston.....Princess of Woodland..

J. J. Rodgers, Abingdon.....Nell of Cottage Grove..

## SECTION 7.

B. R. Pierce, Creston.....Blackbird of Woodland

“ “ .....Pride 2d of Woodland..

J. J. Rodgers, Abingdon.....Little Belle.....

“ “ .....Princess Martha Wash-  
ington.....

## SECTION 8.

B. R. Pierce, Creston.....Young Pearl.....

“ “ .....

J. J. Rodgers, Abingdon.....Lola Pride.....

“ “ .....Edith Belle.....

## SECTION 9.

B. R. Pierce, Creston.....	(not shown).....
J. J. Rodgers, Abingdon .....	.....
“ “ .....	.....
“ “ .....	.....
“ “ .....	.....
“ “ .....	.....
“ “ .....	.....

## SECTION 11.

B. L. Pierce, Creston.....	Wellington.....
“ “ .....	.....
“ “ .....	.....
“ “ .....	.....
J. J. Rodgers, Abingdon.....	Prince Regnant.....
“ “ .....	.....
“ “ .....	Columbus, Jr.....
“ “ .....	Mino Columbia.....
“ “ .....	.....

(Sweepstakes same as shown above.)

## CLASS IV.—GALLOWAY.

## SECTION 1.

S. P. Clarke, Dover .....	Crusader King.....
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## SECTION 2.

S. P. Clarke, Dover .....	Dixon Dixie .....
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## SECTION 3.

S. P. Clarke, Dover .....	Dixie's King.....
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## SECTION 4.

S. P. Clarke, Dover.....

## SECTION 5.

S. P. Clarke, Dover..... Florence Dixie.....  
 " " ..... Victoria 2d.....

## SECTION 6.

S. P. Clarke, Dover..... Tobey 2d of Dover.....

## SECTION 7.

S. P. Clarke, Dover..... Nancy of Dover.....  
 " " .....

## SECTION 8.

S. P. Clarke, Dover.....  
 " " .....

## SECTION 9.

S. P. Clarke, Dover.....  
 " " ..... Victoria 2d of Closeburn  
 " " .....  
 " " ..... Glen of Ivy Gate.....  
 " " ..... Laurigg 8th.....

## SECTION 10.

S. P. Clarke, Dover..... Prince Mark.....  
 " " .....  
 " " ..... Nannie Dover.....  
 " " .....  
 " " ..... Rose of Joy Gate.....

## SECTION 11.

S. P. Clarke, Dover.....		
“	“	.....
“	“	.....
“	“	.....
“	“	.....

## SECTION 12.

S. P. Clarke, Dover.....		
“	“	.....Dixon's Dixie 3d .....
“	“	.....

(Sweepstakes same as shown above).

## CLASS V.—DEVON.

## SECTION 1.

John Hudson, Moweaqua .....	Royal Somerset.....
“	“ .....

## SECTION 2.

John Hudson, Moweaqua .....	Lord Birkley .....
“	“ .....

## SECTION 3.

John Hudson, Moweaqua.....	
“	“ .....
	Walter Farthing.....

## SECTION 4.

John Hudson, Moweaqua .....	Gladstone .....
“	“ .....
	Fragrant Lad .....

## SECTION 5.

John Hudson, Moweaqua .....	Picture 7th.....
“	“ .....

## SECTION 6.

John Hudson, Moweaqua.....  
 " " .....

## SECTION 7

John Hudson, Moweaqua.....  
 " " .....

## SECTION 8.

John Hudson, Moweaqua .....Duchess of Woodland 2d  
 " " .....Honey Dew of Wood-  
 land 6th.....

## SECTION 9.

John Hudson, Moweaqua.....  
 " " .....

"	"	.....
"	"	.....
"	"	.....
"	"	.....
"	"	.....Fancy Robin.....
"	"	.....
"	"	.....
"	"	.....
"	"	.....

## SECTION 10.

John Hudson, Moweaqua.....  
 " " .....

"	"	.....
"	"	.....
"	"	.....Honey Dew of Wood- land 4th.....
"	"	.....Myrtle 18th.....

## SECTION 11.

John Hudson, Moweaqua.....	Quebec.....
“ “ .....	Tulip of Woodland 4th.
“ “ .....	Sarah of Woodland .....
“ “ .....	Heartsease of Woodland
“ “ .....	Duchess of Woodland....
“ “ .....	Milverton.....
“ “ .....	Ben Eldridge .....
“ “ .....	Myrtle 17th.....
“ “ .....	Tulip of Woodland 7th.
“ “ .....	Tulip of Woodland 8th.

## SECTION 12.

John Hudson, Moweaqua.....	Myrtle 15th.....
“ “ .....	Prince of Woodland.....
“ “ .....	.....
“ “ .....	Heartsease of Woodland
“ “ .....	2d .....
“ “ .....	.....
“ “ .....	Heartsease of Woodland
“ “ .....	3d .....

(Sweepstakes same as shown above).

## CLASS VI.—JERSEY.

## SECTION 1.

Latimer & Miller, Abingdon .....	Queen's Dandy .....
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## SECTION 2.

Latimer & Miller, Abingdon .....	Turbigo's Best .....
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## SECTION 3.

Latimer & Miller, Abingdon ..... Queen's Christmas Gift.

## SECTION 4.

Latimer & Miller, Abingdon ..... Hilarious Jim.....

## SECTION 7.

Latimer & Miller, Abingdon ..... Image.....  
 " " ..... Pack's Hallie.....

## SECTION 8.

Latimer & Miller, Abingdon ..... Kittie King's Princess.  
 " " ..... Queen's Katisho.....

## SECTION 9.

Latimer & Miller, Abingdon ..... Queen's Zora.....  
 " " ..... Bonnie Hallie.....

## SECTION 11.

Latimer & Miller, Abingdon.....  
 " " .....  
 " " .....  
 " " .....  
 " " .....

## SECTION 13.

Latimer & Miller, Abingdon ..... Bonanza.....  
 " " .....  
 " " .....

(Sweepstakes same as shown above).

## CLASS XII.—POLLED DURHAM.

## SECTION 1.

Burleigh & Dewey, Mazon.....Red Duke.....

## SECTION 3.

Burleigh & Dewey, Mazon.....Royal.....  
 “ “ .....Superb.....

## SECTION 4.

Burleigh & Dewey, Mazon.....Triumph.....  
 “ “ .....Duke of Hedge Lawn...

## SECTION 5.

Burleigh & Dewey, Mazon.....Pride 18.....  
 “ “ .....Pattie 8.....

## SECTION 6.

Burleigh & Dewey, Mazon.....Bonnie Pride.....

## SECTION 7.

Burleigh & Dewey, Mazon.....Pattie's Pride.....  
 “ “ .....Pride 2d.....

## SECTION 8.

Burleigh & Dewey, Mazon.....Carnation.....

## SECTION 9.

Burleigh & Dewey, Mazon.....  
 “ “ .....Pattie.....  
 “ “ .....  
 “ “ .....  
 “ “ .....

## SECTION 10.

Burleigh & Dewey, Mazon .....	
" " .....	
" " .....	
" " .....	
" " .....	Moss Rose 2d.....
" " .....	Fossite.....

## SECTION 11.

Burleigh & Dewey, Mazon .....	
" " .....	
" " .....	
" " .....	
" " .....	
" " .....	
" " .....	
" " .....	

## SECTION 12.

Burleigh & Dewey, Mazon .....	
" " .....	
" " .....	
" " .....	
" " .....	Lady May.....
" " .....	Grover .....
" " .....	Codo .....

(Sweepstakes same as shown above).

## CLASS XIV.—BROWN SWISS.

## SECTION 1.

E. M. Barton, Hinsdale.....	
" " .....	

## SECTION 2.

A. Bourquin, Nokomis.....	
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## SECTION 3.

E. M. Barton, Hinsdale.....  
 “ “ .....  
 .....

## SECTION 4.

A. Bourquin, Nokomis.....  
 E. M. Barton, Hinsdale.....Hemrick.....  
 .....

## SECTION 5.

A. Bourquin, Nokomis.....Brienzi.....  
 “ “ .....Cornelia.....  
 E. M. Barton, Hinsdale.....Nancy.....  
 “ “ .....  
 .....

## SECTION 6.

A. Bourquin, Nokomis.....  
 “ “ .....  
 E. M. Barton, Hinsdale.....Zoe.....  
 “ “ .....  
 .....

## SECTION 7.

A. Bourquin, Nokomis.....Lelia B.....  
 E. M. Barton, Hinsdale.....May Stauffacher.....  
 “ “ .....  
 .....

## SECTION 8.

A. Bourquin, Nokomis.....  
 “ “ .....  
 E. M. Barton, Hinsdale.....  
 “ “ .....  
 .....

## SECTION 9.

A. Bourquin, Nokomis.....	
“ “ .....	
E. M. Barton, Hinsdale.....	
“ “ .....	

## SECTION 10.

A. Bourquin, Nokomis .....	
“ “ .....	
“ “ .....	
“ “ .....	
“ “ .....	
“ “ .....	
E. M. Barton, Hinsdale.....	
“ “ .....	
“ “ .....	
“ “ .....	
“ “ .....	
“ “ .....	Gabrielle .....
“ “ .....	Werner Stauffacher .....
“ “ .....	Nightingale.....
“ “ .....	Mollie Garfield.....
“ “ .....	Stiefnittecher .....
“ “ .....	Rosebud Blanc .....
“ “ .....	Nocola .....

## SECTION 11.

A. Bourquin, Nokomis.....	Teddy .....
“ “ .....	Ermia .....
“ “ .....	Amito .....
“ “ .....	Roxy.....
“ “ .....	Edith .....

E. M. Barton, Hinsdale .....	Richard Stauffacher .....
" "	.....
" "	.....Echo .....
" "	.....Virgilia .....
" "	.....

## SECTION 12.

A. Bourquin, Nokomis.....	Frederick Stauffacher...
" "	.....Muggins.....
" "	.....Gertie.....
" "	.....Cloe.....
" "	.....Lelia.....
E. M. Barton, Hinsdale.....	
" "	.....Tess .....
" "	.....
" "	.....
" "	.....Mount Blanc.....
" "	.....
" "	.....Leap Year Blanc.....
" "	.....Grover Blanc.....
" "	.....

## SECTION 13.

A. Bourquin, Nokomis.....	Margis—Dam.....
" "	.....
" "	.....
" "	.....
" "	.....
" "	.....
E. M. Barton, Hinsdale.....	
" "	.....
" "	.....
" "	.....Biber.....
" "	.....
" "	.....Bernhard .....

(Sweepstakes same as shown above).

**Division B.—Horses.****CLASS XXI.—STANDARD TROTTER.****SECTION 1.**

L. A. Davis, Geneva.....	Roy Wilkes.....
J. R. Peak & Son, Winchester.....	Kentucky Peak.....
E. B. Smith, Chicago.....	Keswick.....

**SECTION 7.**

Crum Bros., Literberry.....	Nannie.....
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**SECTION 8.**

J. R. Peak & Son, Winchester.....	Flossie Fletcher.....
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**SECTION 9.**

J. R. Peak & Son, Winchester.....	Ardarth.....
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**SECTION 10.**

J. R. Peak & Son, Winchester.....	Nelly Marshall.....
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**SECTION 11.**

Crum Bros., Literberry.....	Algerda.....
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**SECTION 13.**

J. R. Peak & Son, Winchester.....	Marion N.....
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**CLASS XXIII.—FRENCH COACH.****SECTION 1.**

Ed. Miller, Ancona.....	Jongleur.....
M. W. Dunham, Wayne.....	Perfection.....
“ “ .....	Kervella.....

## SECTION 2.

M. W. Dunham, Wayne.....Lord Fritz Graft.....

## SECTION 3.

M. W. Dunham, Wayne.....Rapid.....  
 “ “ .....Urbin.....

## SECTION 4.

M. W. Dunham, Wayne.....Nunphar.....  
 “ “ .....Monaco.....  
 J. P. McWilliams, Dwight.....General.....

## SECTION 5.

M. W. Dunham, Wayne.....Patrician.....  
 “ “ .....Prince Colbri.....

## SECTION 6.

M. W. Dunham, Wayne.....Partisan.....  
 “ “ .....Prospero.....

## SECTION 7.

M. W. Dunham, Wayne.....Sopha.....  
 “ “ .....Elegance.....  
 “ “ .....Gabrielle.....

## SECTION 8.

T. Butterworth, Chicago.....Fugitive.....  
 M. W. Dunham, Wayne.....Liberta.....  
 “ “ .....Ecletante.....

## SECTION 9.

M. W. Dunham, Wayne.....Tempest.....  
 “ “ .....Modestin.....

## SECTION 10.

M. W. Dunham, Wayne ..... Vereine.....

## SECTION 11.

M. W. Dunham, Wayne ..... Mignonne.....

J. P. McWilliams, Dwight..... Beauty.....

“ “ ..... Daisy.....

## SECTION 12.

J. P. McWilliams, Dwight..... Estella.....

## SECTION 13.

M. W. Dunham, Wayne ..... Gabrielle.....

“ ..... Marrienne.....

## SECTION 14.

M. W. Dunham, Wayne ..... Perfect.....

“ “ ..... Idole.....

J. P. McWilliams, Dwight..... Dandola.....

(Sweepstakes not shown above).

## COLLECTION,

M. W. Dunham, Wayne ..... Barbarianna.....

“ “ ..... Parthean.....

“ “ ..... Peruvian.....

“ “ ..... Esmeralda.....

“ “ ..... Heroine.....

CLASS XXIV.—OLDENBURG, HANOVERIAN, TRAKEHNEN  
AND HOLSTEIN COACH.

SECTION 1.

Oltmanns Bros., Agent, Watseka..Emmo	695.....
T. Boekhoff, Watseka .....	Phillipp.....
Oltmanns Bros., “ .....	Wochtmister 942 .....
“ “ .....	Hero .....

SECTION 2.

Oltmanns Bros., Agent, Watseka..Mons	950 .....
Ulfert Poppen, German Valley.....	Young Alexandria.....

SECTION 3.

Oltmanns Bros., Watseka.....	Maninngo 945.....
Oltmanns Bros., Agent, Watseka..	Hobbo 948 .....

SECTION 4.

Oltmanns Bros., Agent, Watseka..	Ajax 949 .....
“ “ .....	...Bertus 947 .....

SECTION 5.

Ulfert Poppen, German Valley.....	Felix 747.....
“ “ .....	.....Ferdinand 749 .....

SECTION 6.

Ulfert Poppen, German Valley.....	Magnet 751.....
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SECTION 7.

Ulfert Poppen, German Valley.....	Young Alexander 585..
“ “ .....	.....
“ “ .....	.....Clara.....

## SECTION 8.

Oltmanns Bros., Watseka.....	Else 22 .....
“ “ .....	Anna 20 .....
Ulfert Poppen, German Valley.....	Angusto 62 .....

## SECTION 10.

Oltmanns Bros., Watseka.....	Henrietta 297 .....
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## SECTION 11.

Oltmanns Bros., Watseka.....	Bell of Watseka.....
Ulfert Poppen, German Valley.....	Frederick 64.....

## SECTION 12.

Oltmanns Bros., Watseka.....	Columbia .....
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## SECTION 13.

Ulfert Poppen, German Valley.....	Clara 100 .....
“ “ .....	Sarah 102 .....

## SECTION 14.

Oltmanns Bros., Watseka.....	Anna.....
Ulfert Poppen, German Valley.....	Mari Augusto.....
“ “ .....	Frederick .....

(Sweepstakes same as shown above).

## CLASS XXV.—CLEVELAND BAY.

## SECTION 1.

Geo. E. Brown, Aurora.....	Eclat 486.....
“ “ .....	Escort 765.....
Stericker Bros, Springfield.....	High Cliffe 555.....
“ “ .....	Ingmanthorpe Baron 754

## SECTION 2.

G. E. Brown, Aurora .....	Marion .....
“ “ .....	Conquest .....
Stericker Bros., Springfield .....	Sir James 668 .....
“ “ .....	Magnet 858 .....
B. F. Dorsey, Sons & Co., Perry..	Rillington Kaiser 1100

## SECTION 3.

G. E. Brown, Aurora .....	Sir Christopher .....
Stericker Bros., Springfield .....	Paragon .....
B. F. Dorsey, Sons & Co., Perry..	Lord Lytton 1190 .....

## SECTION 4.

G. E. Brown, Aurora .....	Harkaway 1007 .....
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## SECTION 5.

G. E. Brown, Aurora .....	Ruby 1009 .....
Stericker Bros., Springfield .....	Paul Pry 957 .....

## SECTION 7.

G. E. Brown, Aurora .....	Gloucester 26 .....
“ “ .....	Sir Christopher 942 .....
Stericker Bros., Springfield .....	Lord Chief Justice .....
“ “ .....	Poppy .....
“ “ .....	Primrose .....

## SECTION 8.

G. E. Brown, Aurora .....	Trinket 5 .....
Stericker Bros., Springfield .....	Dewdrop 4 .....

## SECTION 10.

G. E. Brown, Aurora .....	Eveline 247 .....
“ “ .....	Ester 248 .....
Stericker Bros., Springfield .....	Primrose 175 .....

## SECTION 13.

Stericker Bros., Springfield .....Poppy 286 .....

(Sweepstakes same as above).

## CLASS XXVI.—PERCHERON.

## SECTION 1.

E. Stetson & Son, Neponset.....Victor .....

“ “ .....Hercules.....

M. W. Dunham, Wayne.....Farfoit.....

“ “ .....Fier-a-Brass.....

J. P. McWilliams, Dwight.....Valseur .....

## SECTION 2.

M. W. Dunham, Wayne.....Introvable 16875.....

## SECTION 3.

M. W. Dunham, Wayne.....Argentine.....

“ “ .....Cocardos.....

## SECTION 4.

M. W. Dunham, Wayne.....Isaure .....

“ “ .....Eudonni.....

## SECTION 5.

Ed Hodgson, El Paso.....Duncan .....

“ “ .....Maces.....

M. W. Dunham, Wayne.....Moreri.....

“ “ .....Boissy.....

## SECTION 6.

M. W. Dunham, Wayne.....	Boabdil.....
“ “ .....	Alcalde.....

## SECTION 7.

M. W. Dunham, Wayne.....	Aiglo.....
“ “ .....	Ballantine.....
“ “ .....	Alcalde.....
“ “ .....	Elphin.....

## SECTION 8.

Ed Hodgson, El Paso.....	Estelle.....
“ “ .....	Animore.....
M. W. Dunham, Wayne.....	Bertha.....
“ “ .....	Etoile de Perche.....

## SECTION 10.

M. W. Dunham, Wayne.....	Fontine.....
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## SECTION 11.

M. W. Dunham, Wayne.....	Jeanne d'Arc.....
“ “ .....	Viola.....

## SECTION 12.

M. W. Dunham, Wayne.....	Voltine.....
“ “ .....	Joy.....

## SECTION 14.

M. W. Dunham, Wayne.....	Valentine.....
(Sweepstakes same as shown above).	

## CLASS XXVII.—CLYDESDALE.

## SECTION 1.

Robt. Holloway, Alexis.....Macara 5586.....

## SECTION 2.

Robt. Holloway, Alexis.....Prince of Quality.....

“ “ .....Prince Charming.....

Parker Bros., Wyoming.....Handsome Prince.....

H. Von Biedenfeld, Granville.....Lynedock Chief.....

## SECTION 3.

Robt. Holloway, Alexis.....Magnet.....

“ “ .....Startle.....

## SECTION 4.

Robt. Holloway, Alexis.....Prince Attractive.....

“ “ .....Prince Deserving.....

A. G. Soderberg, Osco.....Scottish Chief.....

## SECTION 5.

Robt. Holloway, Alexis.....Prince Matchless.....

“ “ .....Prince Sturd.....

## SECTION 6.

Robt. Holloway, Alexis.....Prince Darnley.....

“ “ .....Lord Charming.....

## SECTION 7.

Robt. Holloway, Alexis.....Cedric.....

“ “ .....Mognt.....

“ “ .....Lovely Lass.....

## SECTION 8.

Robt. Holloway, Alexis.....	St. Cuthbert's Maggie..
“ “ .....	Minuet .....

## SECTION 9.

Robt. Holloway, Alexis.....	Myrtle.....
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## SECTION 10.

Robt. Holloway, Alexis.....	Marjory .....
A. G. Soderberg, Osco.....	Lady Baron .....

## SECTION 11.

Robt. Holloway, Alexis.....	Crosby Gem.....
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## SECTION 12.

Robt. Holloway, Alexis.....	Fickle Fortune Princess
“ “ .....	Cherry Macara .....

## SECTION 13.

Robt. Holloway, Alexis.....	Princess Minne .....
“ “ .....	Beatrice Regnant.....

## SECTION 14.

Robt. Holloway, Alexis.....	Minnie Tarbroek .....
“ “ .....	Prince Resolute .....
“ “ .....	Cherry Ripe .....
“ “ .....	Princess Charming .....

(Sweepstakes same as above).

(Horses shown in Specials not shown above).

Robt. Holloway, Alexis.....	Prince Expectant .....
“ “ .....	Prince Regnant .....

## CLASS XXVIII.—SHIRE.

## SECTION 1.

G. E. Brown, Aurora.....	Holland Major.....
“ “ .....	Moulton Light of the
	West.....
Burgess Bros., Wenona.....	Knowle Light of the West
“ “ .....	Bar Me.....

## SECTION 2.

B. F. Dorsey & Sons, Perry .....	Jururno .....
G. E. Brown, Aurora.....	Major's Sort.....
Burgess Bros., Wenona.....	Wenona Albert.....

## SECTION 3.

G. E. Brown, Aurora.....	Major Clark .....
“ “ .....	Major Lincoln.....
Burgess Bros., Wenona.....	Nonpareil.....

## SECTION 4.

G. E. Brown, Aurora.....	Major Winthrop.....
“ “ .....	Sir William.....
Burgess Bros., Wenona.....	Wenona Hercules.....

## SECTION 5.

G. E. Brown, Aurora.....	Major Murray .....
Burgess Bros., Wenona.....	Columbia .....
“ “ .....	Wenona Cardinal.....

## SECTION 6.

Burgess Bros., Wenona.....	Wenona Romeo.....
“ “ .....	Wenona Giant.....

## SECTION 7.

Burgess Bros., Wenona.....	Nielston Helpmate.....
“ “ .....	Wenona Columbia.....
“ “ .....	Wenona Harold.....
“ “ .....	Wenona Primrose.....
“ “ .....	Wenona Empress.....
“ “ .....	Wenona Brunette.....

## SECTION 8.

A. G. Soderberg, Osco.....	Sonsie .....
A. W. Hopkins, Peru .....	Larnock Daisy 2d.....
G. E. Brown, Aurora .....	Axtel.....
Burgess Bros., Wenona.....	Wenona Maid.....
“ “ .....	English Trust.....

## SECTION 9.

Burgess Bros., Wenona.....	Wenona Peach .....
“ “ .....	Wenona Gray.....

## SECTION 10.

Burgess Bros., Wenona.....	Wenona Chance.....
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## SECTION 12.

Burgess Bros., Wenona.....	Wenona .....
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## SECTION 13.

Burgess Bros., Wenona.....	Wenona Brunette.....
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## SECTION 14.

Burgess Bros., Wenona.....	Lady Doof.....
(Sweepstakes same as shown above).	

## SECTION 17.—COLLECTION.

G. E. Brown, Aurora.....	(not shown) .....
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## CLASS XXIX.—FRENCH DRAFT.

## SECTION 1.

Ed Hodgson, El Paso.....	Belair.....
“ “ .....	Montfort.....
M. W. Dunham, Wayne.....	Saintongs.....

## SECTION 2.

Ed Hodgson, El Paso.....	Conde.....
Ed Miller, Ancona.....	Byron.....
M. W. Dunham, Wayne.....	Milton.....

## SECTION 3.

Ed Hodgson, El Paso.....	Hilaire.....
M. W. Dunham, Wayne.....	Negro.....

## SECTION 4.

Ed Hodgson, El Paso.....	Earlville.....
“ “ .....	Mogemont.....
M. W. Dunham, Wayne.....	Brite.....

## SECTION 5.

Ed Hodgson, El Paso.....	Fontain.....
“ “ .....	Arion.....
Ed Miller, Ancona.....	Louis Napoleon.....
“ “ .....	Dandy Montfort.....
M. W. Dunham, Wayne.....	Alcola.....

## SECTION 6.

M. W. Dunham, Wayne.....	Leonidas.....
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## SECTION 7.

Ed Hodgson, El Paso.....	Columbia.....
Ed Miller, Ancona.....	Montfort.....
“ “ .....	Dollie.....
M. W. Dunham, Wayne.....	LaFerte.....
“ “ .....	Morene.....
“ “ .....	Chimere.....

## SECTION 8.

Ed Hodgson, El Paso.....	Suzanne.....
“ “ .....	Lovette.....
Ed Miller, Ancona.....	Viola.....
M. W. Dunham, Wayne.....	Semele.....
“ “ .....	Eldorado.....

## SECTION 9.

Ed Hodgson, El Paso.....	Sylva.....
“ “ .....	Olivette.....

## SECTION 10.

Ed Hodgson, El Paso.....	Lordine.....
Wm. Fry, El Paso.....	Rhode.....

## SECTION 11.

Ed Hodgson, El Paso.....	Helena.....
M. W. Dunham, Wayne.....	Virginia.....
“ “ .....	Hazel.....

## SECTION 12.

Ed Hodgson, El Paso.....	Min.....
“ “ .....	Betsy.....
Ed Miller, Ancona.....	Margaret.....
M. W. Dunham, Wayne.....	Letonere.....
“ “ .....	Bertine.....

## SECTION 14.

M. W. Dunham, Wayne ..... Eldora .....  
 (Sweepstakes same as shown above).

## CLASS XXXII.—HACKNEY.

## SECTION 1.

Stericker Bros., Springfield ..... Pontifex .....  
 “ “ ..... Bective .....  
 Burgess Bros., Wenona ..... Ringmaster .....

## SECTION 2.

Chas. C. Munroe, Rushville ..... Lord Green .....

## SECTION 3.

Stericker Bros., Springfield ..... Ruby .....

## SECTION 6.

Burgess Bros., Wenona ..... Wenona Index .....

## SECTION 8.

Burgess Bros., Wenona ..... Black Queen .....  
 (Sweepstakes same as shown above).

## CLASS XXXIII.—MORGAN.

## SECTION 1.

Morgan Horse Co., Carpentersville. Sultan .....  
 “ “ Hillside Morgan .....

## SECTION 3.

Morgan Horse Co., Carpentersville. Winnebago Morgan .....

## SECTION 4.

Morgan Horse Co., Carpentersville. Capt. Allen .....  
 “ “ Commodore Allen.....

## SECTION 5.

Morgan Horse Co., Carpentersville. Luke Morgan.....

## SECTION 6.

Morgan Horse Co., Carpentersville. Duke Morgan.....

## SECTION 8.

Morgan Horse Co., Carpentersville. Sunset Morgan.....  
 “ “ Flora 2d.....

## SECTION 11.

Morgan Horse Co., Carpentersville. Tempest Morgan.....

## SECTION 13.

Morgan Horse Co., Carpentersville. Eulalia Morgan.....  
 (Sweepstakes same as shown above).

## CLASS XXXV.—AMERICO-ARAB.

## SECTION 4.

M. W. Dunham, Wayne ..... Peruvian.....

## SECTION 6.

M. W. Dunham, Wayne ..... Margot .....  
 “ “ ..... Adalie.....

## SECTION 10.

M. W. Dunham, Wayne ..... Marianna.....  
 “ “ ..... Adelino .....  
 (Sweepstakes same as shown above).

## CLASS XXXVI.—FRENCH TROTTERS.

## SECTION 1.

M. W. Dunham, Wayne .....	
“ “ .....	Agnadel .....

## SECTION 2.

M. W. Dunham, Wayne .....	Forcinal .....
“ “ .....	Cagny .....

## SECTION 3.

M. W. Dunham, Wayne .....	Marandeur .....
“ “ .....	Merlerault .....

## SECTION 4.

M. W. Dunham, Wayne .....	Cascadur .....
“ “ .....	Eclair .....

## SECTION 5.

M. W. Dunham, Wayne .....	Inkermann .....
“ “ .....	Ionian .....

## SECTION 6.

M. W. Dunham, Wayne .....	Instant .....
“ “ .....	Idole .....

## SECTION 7.

M. W. Dunham, Wayne .....	Indre .....
	Isaura .....
	Instant .....
	Idole .....

## SECTION 8.

M. W. Dunham, Wayne .....	Isaure Clemence .....
“ “ .....	Ketty .....

## SECTION 9.

M. W. Dunham, Wayne.....Allixia.....

## SECTION 10.

M. W. Dunham, Wayne.....Mimosa.....

“ “ .....Fleur-de-lis.....

## SECTION 11.

M. W. Dunham, Wayne.....Eneide.....

## SECTION 12.

M. W. Dunham, Wayne.....

“ “ .....Peerless.....

## SECTION 13.

M. W. Dunham, Wayne.....

“ “ .....Etoile.....

## SECTION 14.

M. W. Dunham, Wayne.....Isaure Clemence.....

“ “ .....Inez.....

“ “ .....Isaura.....

M. W. Dunham, Wayne.....Sans Vergogna.....

“ “ .....Eclair.....

“ “ .....Instant.....

(Sweepstakes same as shown above).

## SECTION 17.

Collection consisting of 2 stallions and 3 mares under  
4 years old.

M. W. Dunham, Wayne.....

“ “ .....Italie.....

“ “ .....Inkerman.....

“ “ .....Idole.....

“ “ .....

## CLASS XXXVII—SADDLE.

## SECTION 1.

S. R. Powell, Peoria.....Artist, Jr.....:

## SECTION 2.

Ed Hodgson, El Paso.....Chenault.....  
 “ “ .....Woodford.....

## SECTION 4.

C. B. Pratt, Chicago.....Lottie P.....

## SECTION 5.

J. P. McWilliams, Dwight.....Bess.....

## SECTION 6.

Ed Hodgson, El Paso.....Miss Anderson.....

## SECTION 7.

J. B. White, Chicago.....Indian Boy.....  
 (Sweepstakes same as above).

## SPECIAL CLASS—PARK AND FANCY GAIT.

C. B. Pratt, Chicago.....Boy Chief.....

*Specials offered by W. I. Buchanan.*

C. B. Pratt, Chicago.....Monie B.....  
 M. W. Dunham, Wayne.....Annie.....

## CLASS XXXIX.—JACKS AND JENNETS.

## SECTION 2.

Converse Bros., Springfield.....Boston.....

## SECTION 3.

Mason & Hill, Auburn.....Antar, Jr.....

## SECTION 4.

A. W. Hopkins, Peru.....Black Forest.....  
 “ “ .....Duke.....

## SECTION 5.

A. W. Hopkins, Peru.....Black Oak.....  
 “ “ .....Favorite.....

## SECTION 6.

Converse Bros., Springfield....Columbus.....

## SECTION 7.

Converse Bros., Springfield.....  
 “ “ .....Antar.....

## SECTION 8.

Converse Bros., Springfield.....Sangamon Belle.....  
 “ “ .....Belle of Illinois.....

## SECTION 12.

Converse Bros., Springfield.....Columbia.....

## SECTION 14.

Converse Bros., Springfield.....Miss Lyon.....  
 (Sweepstakes same as shown above).

## SPECIAL CLASS—MULES.

## SECTION 6.

Converse Bros., Springfield.....	Belle.....
“ “ .....	Ruth.....

## Special Horses to Harness.

## STANDARD TROTTER.

## SINGLE STALLION.

J. R. Peak & Son, Winchester.....	Kentucky Peak.....
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## PAIR MARES TO HARNESS.

J. R. Peak & Son, Winchester.....	Flossy Fletcher.....
“ “ .....	Ardarth.....
Crum Bros., Literberry.....	Peerse.....
“ “ .....	Nannie.....

## FRENCH COACH.

## SINGLE STALLION.

M. W. Dunham, Wayne.....	Premier.....
“ “ .....	Prince Colbri.....
“ “ .....	Parthian.....

## SINGLE MARE.

M. W. Dunham, Wayne.....	Esmeralda.....
“ “ .....	Atlanta.....
“ “ .....	Barbarianna.....
“ “ .....	Heroine.....

## FRENCH TROTTER.

## SINGLE STALLION.

M. W. Dunham, Wayne ..... Ionian .....

## SINGLE MARE.

M. W. Dunham, Wayne ..... Peerless .....

“ “ ..... Inez .....

## HORSES, EQUIPAGES AND APPOINTMENTS.

## SECTION 1.

J. R. Peak & Son, Winchester..... Flossy C .....

“ “ ..... Patsy .....

Crum Bros., Literberry ..... Bonny .....

Marmaduke Wood, Chicago..... Salvador .....

“ “ ..... Jupiter .....

## SECTION 2.

Marmaduke Wood, Chicago..... Neptune .....

## SECTION 3.

J. R. Peak & Son, Winchester..... Flossy .....

## SECTION 9.

Crum Bros., Literberry ..... Alice .....

## PONIES IN HARNESS.

Mallen Bowen, Chicago ..... Nightingale .....

*Special Prize Bronze Statue offered by French Government.*

M. W. Dunham, Wayne ..... Iphigene .....

“ “ ..... Maringo .....

“ “ ..... Laigle .....

M. W. Dunham, Wayne	Trafalgar
"	Lauchier
"	Kasbath
"	Indre
"	Ketty
"	San Vergogne
"	Isan Clemence
"	Modestine
"	Fleur-de-Lis
"	Italie
"	Agnadel
"	Forcina
"	Marauder
"	Euclair
"	Inkerman
"	Allixia
"	Mimosa
"	Eneid

## SPECIAL.

L. A. Davis, Geneva	Roy Wilkes
M. W. Dunham, Wayne	Brilliant
"	Aiglon
"	LaFerte
"	Valentine
"	Alone
"	Indre
"	Elizabeth
"	Isaur Clemence
"	San Vergogne
"	Bettino
"	Pervenche
"	San Tache
"	Perfection

**Division C.—Sheep.****CLASS XLIII.—SOUTHDOWN.****SECTION 2.**

J. H. Potts & Son, Jacksonville..Viceroy.....

**SECTION 3.**

J. H. Potts & Son, Jacksonville..Monarch.....  
 “ “ ..Brightly.....

**SECTION 4.**

J. H. Potts & Son, Jacksonville..Athol.....

**SECTION 5.**

J. H. Potts & Son, Jacksonville..Diamond.....  
 “ “ ..Belle of Morgan.....

**SECTION 6.**

J. H. Potts & Son, Jacksonville..Lady Coleman.....

**SECTION 7.**

J. H. Potts & Son, Jacksonville..Lady Webb 18.....  
 “ “ ..Pet 11th.....

**SECTION 8.**

J. H. Potts & Son, Jacksonville..Pet 12th.....

**SECTION 10.**

J. H. Potts & Son, Jacksonville..Queen.....  
 “ “ ..Lady Coleman 14th.....

## SECTION 11.

J. H. Potts & Son, Jacksonville..	King.....
“	“ ..Pet 11th.....
“	“ ..Lady Webb 19th.....

(Sweepstakes same as shown above).

## CLASS XLIV.—SHROPSHIRE.

## SECTION 1.

Geo. Allen & Son, Allerton.....	Proud Salopian.....
“	“ .....McFee's Miracle.....

## SECTION 3.

Geo. Allen & Son, Allerton.....	Young Salopian.....
“	“ .....Conqueror 2d.....

## SECTION 4.

Geo. Allen & Son, Allerton.....	The Swell.....
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## SECTION 5.

Geo. Allen & Son, Allerton.....	Allen's 1138.....
“	“ .....Allen's 1231.....

## SECTION 6.

Geo. Allen & Son, Allerton.....	Allen's 1359.....
“	“ .....Allen's 1281.....

## SECTION 7.

Geo. Allen & Son, Allerton.....	Lady Thorpe.....
“	“ .....Allen's 1581.....

## SECTION 8.

Geo. Allen & Son, Allerton .....	Victoria Queen.....
“ “ .....	Queen.....

## SECTION 10.

Geo. Allen & Son, Allerton .....	Allen's 1334 .....
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## SECTION 11.

Geo. Allen & Son, Allerton .....	Bar None.....
“ “ .....	Allen's 1659.....
“ “ .....	Allen's 1642.....

(Sweepstakes same as shown above).

## CLASS XLV.—OXFORD.

## SECTION 1.

Stone & Harris, Stonington .....	Royal Tom.....
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## SECTION 2.

Stone & Harris, Stonington .....	Jim Corbett.....
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## SECTION 3.

Stone & Harris, Stonington .....	Chicago of Stonington.
“ “ .....	Dick Stone.....

## SECTION 4.

Stone & Harris, Stonington .....	Lord Dornford .....
“ “ .....	Woodstock.....

## SECTION 5.

Stone & Harris, Stonington .....	Waddesdon Girl.....
“ “ .....	Winchendon 5.....

## SECTION 6.

Stone & Harris, Stonington .....	Waddesdon Lass 5th...
" " .....	Waddesdon Lass 6th...

## SECTION 7.

Stone & Harris, Stonington .....	Winchendon 78 .....
" " .....	Winchendon 72 .....

## SECTION 8.

Stone & Harris, Stonington .....	Howell Pollie .....
" " .....	Howell Pet .....

## SECTION 9.

Stone & Harris, Stonington .....	Waddesdon Girl 3d .....
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## SECTION 10.

Stone & Harris, Stonington .....	Stone & Harris 688 .....
" " .....	" 681 .....
" " .....	" 663 .....
" " .....	" 642 .....
" " .....	" 617 .....

## SECTION 11.

Stone & Harris, Stonington .....	Stone & Harris 720 .....
" " .....	" 736 .....
" " .....	" 731 .....
" " .....	" 702 .....
" " .....	" 721 .....

(Sweepstakes same as shown above).

## CLASS XLVII.—MERINO (A).

## SECTION 1.

E. Peck & Son, Geneva.....	873 .....
“ “ .....	986 .....

## SECTION 2.

E. Peck & Son, Geneva.....	311 .....
“ “ .....	99 .....

## SECTION 3.

E. Peck & Son, Geneva.....	321 .....
“ “ .....	326 .....

## SECTION 5.

E. Peck & Son, Geneva.....	2380 .....
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## SECTION 6.

E. Peck & Son, Geneva.....	212 .....
“ “ .....	220 .....

## SECTION 7.

E. Peck & Son, Geneva.....	238 .....
“ “ .....	242 .....

## SECTION 8.

E. Peck & Son, Geneva.....	2734 .....
“ “ .....	1280 .....

## SECTION 10.

E. Peck & Son, Geneva.....	1248 .....
“ “ .....	2870 .....
“ “ .....	2635 .....
“ “ .....	1211 .....
“ “ .....	1214 .....

## SECTION 11.

E. Peck & Son, Geneva.....	2563 .....
“ “ .....	1068 .....
“ “ .....	1255 .....
“ “ .....	1277 .....
“ “ .....	1266 .....

(Sweepstakes same as shown above).

## CLASS XLVIII.—MERINO (B).

## SECTION 1.

E. Peck & Son, Geneva.....	2475 .....
“ “ .....	980 .....

## SECTION 2.

E. Peck & Son, Geneva.....	1006 .....
“ “ .....	1012 .....

## SECTION 3.

E. Peck & Son, Geneva.....	322 .....
“ “ .....	328 .....

## SECTION 5.

E. Peck & Son, Geneva.....	2385 .....
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## SECTION 6.

E. Peck & Son, Geneva.....	210 .....
“ “ .....	223 .....

## SECTION 7.

E. Peck & Son, Geneva.....	258 .....
“ “ .....	235 .....

## SECTION 8.

E. Peck & Son, Geneva.....	1279 .....
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## SECTION 10.

E. Peck & Son, Geneva.....	841 .....
“ “ .....	2669 .....
“ “ .....	1240 .....
“ “ .....	1239 .....

(Sweepstakes same as shown above).

## Division D.—Swine.

## CLASS LV.—BERKSHIRE.

## SECTION 1.

B. F. Dorsey & Sons, Perry .....	Barry Grand Duke.....
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## SECTION 2.

A. J. Lovejoy, Roscoe.....	Golden King.....
“ “ .....	Royal Lee 2d .....
B. F. Dorsey & Sons, Perry.....	Sullivan's Choice.....

## SECTION 3.

B. F. Dorsey & Sons, Perry.....	Broad Fellow .....
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## SECTION 4.

B. F. Dorsey & Sons, Perry.....	Dandy.....
“ “ .....	Handsome.....

## SECTION 5.

B. F. Dorsey & Sons, Perry.....	Queen of Quality.....
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## SECTION 6.

A. J. Lovejoy, Roscoe.....	Lady Kings Cote.....
“ “ .....	Cherry Blossom Sallie..
B. F. Dorsey & Sons, Perry.....	Beauty 6th.....
“ “ .....	Columbia .....

## SECTION 7.

A. J. Lovejoy, Roscoe.....	Lady Kings Cote 5th..
“ “ .....	Lady Kings Cote 6th..
B. F. Dorsey & Sons, Perry.....	Lady of Carlisle 7th....
“ “ .....	Lady of Carlisle 8th....

## SECTION 8.

A. J. Lovejoy, Roscoe.....	Riverside Belle 16th....
B. F. Dorsey & Sons, Perry.....	Queen of Quality 2d....
“ “ .....	Queen of Quality 3d....

## SECTION 9.

A. J. Lovejoy, Roscoe.....	Riverside Belle 5th.....
B. F. Dorsey & Sons, Perry.....	Beauty 7th.....
“ “ .....	Beauty 6th.....

## SECTION 10.

A. J. Lovejoy, Roscoe.....	Cherry Blossom Sallie 5th.....
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## SECTION 11.

A. J. Lovejoy, Roscoe.....	King's Duke .....
“ “ .....	“ “ .....
B. F. Dorsey & Sons, Perry.....	Lady of Carlisle 9th....

## SECTION 13.

B. F. Dorsey & Sons, Perry.....	Sullivan .....
(Sweepstakes same as above shown).	

## CLASS LVI.—POLAND-CHINA.

## SECTION 1.

F. M. Bauder, New Milford.....	Tecumseh King .....
B. F. Dorsey & Sons, Perry.....	Short Stop .....
“ “ .....	Stumpy Ashby.....
C. W. Trone, Rushville.....	Roy Wilkes .....

## SECTION 2.

Danforth Bros., Deer Creek .....	Onward.....
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## SECTION 3.

F. M. Bauder, New Milford.....	Black U. S. Boy.....
B. F. Dorsey & Sons, Perry.....	Catcher .....

## SECTION 4.

F. M. Bauder, New Milford.....	Black Jack.....
B. F. Dorsey & Sons, Perry.....	Allerton .....
“ “ .....	Allerton Boy.....
Thomas Bennett, Rossville.....	George .....

## SECTION 5.

Danforth Bros., Deer Creek.....	Columbia.....
B. F. Dorsey & Sons, Perry.....	Lady Allerton.....
“ “ .....	Lady Nelson.....
C. W. Trone, Rushville.....	Nora Stark.....

## SECTION 6.

Danforth Bros., Deer Creek.....	Grand Lady.....
F. M. Bauder, New Milford.....	Lady Surprise.....
“ “ .....	Free Trade Queen.....
B. F. Dorsey & Sons, Perry.....	Fanny Joker 4th.....
“ “ .....	Cleopatra.....

## SECTION 7.

Danforth Bros., Deer Creek.....	Our Daisy.....
F. M. Bauder, New Milford.....	Model.....
“ “ .....	Lady Wanamaker.....
B. F. Dorsey & Sons, Perry .....	Ideal Lady.....
“ “ .....	Eulalia.....

## SECTION 8.

Thomas Bennett, Rossville.....	Topsey.....
F. M. Bauder, New Milford.....	Rosa Bell 2d.....
“ “ .....	Rosa Bell 3d.....
B. F. Dorsey & Sons, Perry.....	May Allerton.....
“ “ .....	Perfection.....

## SECTION 9.

Danforth Bros., Deer Creek.....	Hopeful.....
B. F. Dorsey & Sons, Perry.....	Sportsman.....
“ “ .....	Lady Dorsey.....
“ “ .....	Columbia Lady.....

## SECTION 11.

B. F. Dorsey & Sons, Perry.....Nelson Allen.....

## SECTION 12.

Danforth Bros., Deer Creek.....Loyal Duke.....

“ “ .....Notoriety.....

“ “ .....Peaceful Kate.....

B. F. Dorsey & Sons, Perry.....Ollie.....

## SECTION 13.

B. F. Dorsey & Sons, Perry.....Fancy Joker.....

## SECTION 14.

B. F. Dorsey & Sons, Perry.....Umpire.....

“ “ .....Myrtle.....

“ “ .....May French.....

(Sweepstakes same as shown above).

## CLASS LVII.—CHESTER WHITE.

## SECTION 1.

M. E. Newburn, Hennepin.....Putnam Duke.....

## SECTION 2.

M. E. Newburn, Hennepin.....Eclipse.....

“ “ .....Royal.....

## SECTION 3.

M. E. Newburn, Hennepin.....Jupiter.....

## SECTION 4.

M. E. Newburn, Hennepin.....Storm.....

## SECTION 5.

M. E. Newburn, Hennepin.....	Hennepin Belle.....
“ “ .....	Hennepin Maid.....

## SECTION 6.

M. E. Newburn, Hennepin.....	Queen.....
“ “ .....	Princess A .....

## SECTION 7.

M. E. Newburn, Hennepin.....	Venus.....
“ “ .....	Venus 2d .....

## SECTION 8.

M. E. Newburn, Hennepin.....	Ida.....
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## SECTION 9.

M. E. Newburn, Hennepin.....	Princess B.....
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## SECTION 11.

M. E. Newburn, Hennepin.....	Venus 3d .....
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## SECTION 14.

M. E. Newburn, Hennepin.....	General.....
“ “ .....	Snow.....

(Sweepstakes same as shown above).

## CLASS LVIII.—DUROC JERSEY.

## SECTION 1.

Thos. Bennett, Rossville .....	Cuckoo.....
J. M. Stonebraker, Panola.....	Exchanger.....

## SECTION 2.

Thos. Bennett, Rossville .....	Cleveland .....
G. W. Trone, Rushville .....	Buffalo Bill.....

## SECTION 3.

Thos. Bennett, Rossville.....	Hero .....
J. M. Stonebraker, Panola .....	Buchanan .....
G. W. Trone, Rushville .....	Rattlesnake Pete.....

## SECTION 4.

Thos. Bennett, Rossville .....	Jim .....
“ “ .....	John .....
J. M. Stonebraker, Panola .....	Royal Duke .....
“ “ .....	Henry Clay .....
G. W. Trone, Rushville .....	Phil Armour .....
“ “ .....	Johnny Mack .....

## SECTION 5.

Thos. Bennett, Rossville .....	Remarkable .....
J. M. Stonebraker, Panola .....	Guina .....
G. W. Trone, Rushville .....	Trone's Prize.....

## SECTION 6.

Thos. Bennett, Rossville .....	Nancy .....
“ “ .....	Quick .....
J. M. Stonebraker, Panola .....	Marthy .....

## SECTION 7.

Thos. Bennett, Rossville .....	Brightness .....
“ “ .....	Famous .....
G. W. Trone, Rushville .....	Roxy 1st .....
“ “ .....	Roxy 2d .....

## SECTION 8.

Thos. Bennett, Rossville .....	Eugenia .....
“ “ .....	Hattie .....
J. M. Stonebraker, Panola .....	Model of Beauty .....
“ “ .....	Princess Eulalia .....
G. W. Trone, Rushville .....	Grace Darling .....
“ “ .....	Grace Darling 2d .....

## SECTION 11.

Thos. Bennett, Rossville.....Mattie.....  
 G. W. Trone, Rushville.....Roxy 3d.....

## SECTION 12.

J. M. Stonebraker, Panola.....Perfection.....  
 " " .....Duchess of Woodford...

## SECTION 13.

J. M. Stonebraker, Panola.....Chart.....  
 " " .....Sir Knight.....  
 " " .....Exchanger 2d.....  
 G. W. Trone, Rushville.....Grace Darling 3d.....

## SECTION 14.

Thos. Bennett, Rossville.....Prosperity.....  
 " " .....Eugene.....  
 J. M. Stonebraker, Panola.....Red Lady.....  
 (Sweepstakes same as shown above).

## CLASS LIX.—SMALL YORKSHIRE.

## SECTION 1.

A. P. Chapman, Sugar Grove.....Cæsar 3d.....

## SECTION 2.

A. P. Chapman, Sugar Grove.....Grover Boy.....

## SECTION 3.

A. P. Chapman, Sugar Grove.....Wilber.....

## SECTION 4.

A. P. Chapman, Sugar Grove.....Robbie.....  
 " " .....Cæsar's Frankie.....

## SECTION 5.

A. P. Chapman, Sugar Grove.....Hannah Girl.....  
 “ “ .....Prize Chub.....

## SECTION 6.

A. P. Chapman, Sugar Grove.....Prize Chub's Best.....

## SECTION 7.

A. P. Chapman, Sugar Grove.....Jennie Cole.....

## SECTION 8.

A. P. Chapman, Sugar Grove.....Cæsar's Pansy.....  
 “ “ .....Cæsar's Violet.....

## SECTION 9.

A. P. Chapman, Sugar Grove.....Cæsar 4th.....  
 (Sweepstakes same as shown above).

## CLASS LX.—ESSEX.

## SECTION 1.

H. H. Taylor, Heyworth.....Seldom Seen.....

## SECTION 2.

Thos. Taylor, Waynesville.....Grover.....

## SECTION 3.

H. H. Taylor, Heyworth.....Dan.....

## SECTION 5.

Thos. Taylor, Waynesville.....Sarah 7th.....  
 “ “ .....Lady Perfection 2d.....

## SECTION 6.

Thos. Taylor, Waynesville.....Nellie G.....

## SECTION 7.

H. H. Taylor, Heyworth.....	Bell 2d.....
“ “ .....	Bell 3d.....

## SECTION 10.

Thos. Taylor, Waynesville.....	Lady Perfection .....
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## SECTION 11.

H. H. Taylor, Heyworth.....	Bell 4th .....
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## SECTION 13.

H. H. Taylor, Heyworth.....	Bert .....
(Sweepstakes same as shown above).	

**Fat Stock.****CLASS CXLVIII.—SHORT-HORN.**

## SECTION 1.

M. E. Jones, Williamsville.....	Dr. Talmage.....
“ “ .....	Headlight .....
J. H. Potts & Son, Jacksonville..	Viceroy .....

## SECTION 2.

M. E. Jones, Williamsville.....	Drum Major.....
“ “ .....	Whiskers.....
J. H. Potts & Son, Jacksonville..	Yroder Jr .....

## SECTION 3.

M. E. Jones, Williamsville.....	Roll of Honor.....
“ “ .....	Bon Ton.....
J. H. Potts & Son, Jacksonville..	Prather.....

(Herd and sweepstakes same as shown above).

## CLASS CXLIX.—HEREFORD.

## SECTION 2.

H. J. Fluck, Goodenow.....Percy .....  
 Tom C. Ponting, Moweaqua.....Ogden Armour .....

## SECTION 3.

Tom C. Ponting, Moweaqua.....Potter Palmer.....  
 (Herd and sweepstakes same as shown above).

## CLASS CL.—ANGUS.

## SECTION 2.

B. R. Pierce, Creston.....Prince of Woodlawn ....

## CLASS CLII.—DEVON.

## SECTION 1.

John Hudson, Moweaqua .....Lord Stanley.....  
 “ “ .....Taffy on the Stick .....  
 “ “ .....Yankee Doodle.....

## SECTION 2.

John Hudson, Moweaqua .....Taffy Jr.....  
 “ “ .....Sam Kidner.....

## SECTION 3.

John Hudson, Moweaqua .....Constitution .....  
 “ “ .....Inter Ocean .....  
 (Herd and sweepstakes same as shown above).

## CLASS CLV.—GRADES AND CROSSES.

M. E. Jones, Williamsville.....Baymer Bearer.....  
 T. C. Ponting, Moweaqua.....Montgomery Ward.....

## SECTION 2.

M. E. Jones, Williamsville.....Jack in the Bush.....  
 H. J. Fluck, Goodenow.....Freeport.....

## SECTION 3.

M. E. Jones, Williamsville.....Flying Dutchman.....  
 (Herd and sweepstakes same as above shown).

## CLASS CLXIV.—SOUTHDOWN.

## SECTION 1.

J. H. Potts & Son, Jacksonville..Charlie Coleman.....  
 “ “ Prince Charlie.....  
 “ “ Duke.....

## SECTION 2.

J. H. Potts & Son, Jacksonville..Duke 2d.....  
 “ “ Champion.....

## SECTION 3.

J. H. Potts & Son, Jacksonville..Arthur.....  
 “ “ David.....  
 “ “ Herbert.....  
 (Sweepstakes same as shown above).

## CLASS CLXXIII.—BERKSHIRE.

## SECTION 1.

Cass & Burns, Buffalo Hart.....Artist.....

## SECTION 2.

Cass & Burns, Buffalo Hart.....Matchless.....  
 “ “ .....Bar None.....

## SECTION 3.

Cass & Burns, Buffalo Hart.....Dandy.....  
 “ “ .....Goodenow.....

## SECTION 4.

(Pen same as shown above.)

## CLASS CLXXIV.—POLAND-CHINA.

## SECTION 1.

Thos. Bennet, Rossville.....Emperor.....

## CLASS CLXXVI.—DUROC JERSEY.

## SECTION 1.

Thos. Bennett, Rosville.. .....Chief.....

## SECTION 2.

Thos. Bennett, Rosville.....Record.....  
 “ “ .....News.....

## SECTION 3.

Thos. Bennett, Rosville.....Tribune.....  
 “ “ .....Times.....

(Pen same as shown above.)

## CLASS CLXXVII.—SMALL YORKSHIRE.

## SECTION 1.

A. P. Chapman, Sugar Grove.....Gus.....  
 “ “ .....Grove.....

## SECTION 2.

A. P. Chapman, Sugar Grove.....Alfred.....  
 “ “ .....Archie.....

## SECTION 3.

A. P. Chapman, Sugar Grove.....Cæsar.....  
 “ “ .....Lee.....  
 (Pen same as shown above.)

## CLASS CLXXIX.—ESSEX.

## SECTION 1.

Thos. Taylor, Waynesville.....Jim .....

## SECTION 2.

Thos. Taylor, Waynesville.....Joe.....

## SECTION 3.

Thos. Taylor, Waynesville.....Bill.....  
 (Pen same as shown above).

## CLASS CXXXII.—GRADES AND CROSSES.

## SECTION 1.

Cass & Burns, Buffalo Hart.....Knox All.....

## SECTION 2.

Cass & Burns, Buffalo Hart.....Cracker Jack .....

“ “ .....Sure Shot.....

## SECTION 3.

Cass & Burns, Buffalo Hart.....Get There.....

“ “ .....Billy.....

A. P. Chapman, Sugar Grove.....Fred.....

“ “ .....Jim.....

(Pen same as shown above).

## BREEDERS' SWEEPSTAKES.

Cass & Burns, Buffalo Hart.....Seneca.....

“ “ .....Dick.....

**Poultry.****CLASS CVI.—AMERICAN.****SECTION 1.—BARRED PLYMOUTH COCK.****COCK.**

B. E. Rodgers, Lake Bluff.....	1.....
J. M. Rapp, La Moille.....	1.....

**HEN.**

Jacob Wolf, Bloomington.....	1.....
E. Peck & Son, Geneva.....	1.....
B. E. Rodgers, Lake Bluff.....	1.....
J. M. Rapp, La Moille.....	1.....

**COCKEREL.**

S. S. Noble, Bloomington.....	1.....
J. F. Wolf, Bloomington.....	1.....
A. & E. Tarbox, Yorkville.....	1.....
J. B. Foot, Norwood Park.....	1.....
E. Peck & Son, Geneva.....	1.....
B. E. Rodgers, Lake Bluff.....	1.....
J. M. Rapp, La Moille.....	1.....

**PULLET.**

J. F. Wolf, Bloomington.....	1.....
J. B. Foot, Norwood Park.....	1.....
R. A. Haeger, Algonquin.....	1.....
E. Peck & Son, Geneva.....	1.....
J. M. Rapp, La Moille.....	1.....

**BREEDING PEN.**

B. E. Rodgers, Lake Bluff.....	5.....
Reliable Poultry Farm, Quincy.....	5.....

## SECTION 3.—WHITE PLYMOUTH ROCK.

## COCK.

E. Peck & Son, Geneva .....1.....

## HEN.

E. Peck & Son, Geneva .....1.....

## COCKEREL.

E. Peck & Son, Geneva .....1.....

## PULLET.

E. Peck & Son, Geneva .....1.....

(Breeding Pen not shown).

## SECTION 4.—BLACK JAVA.

## COCKEREL.

H. Hodgson, Albion .....1.....

## PULLET.

H. Hodgson, Albion .....1.....

## SECTION 7.—SILVER WYANDOTTE.

## COCK.

A. & E. Tarbox, Yorkville:.....1.....

W. H. Millard, Genoa.....1.....

B. E. Rodgers, Lake Bluff.....1.....

## HEN.

A. & E. Tarbox, Yorkville.....1.....

W. H. Millard, Genoa.....1.....

B. E. Rodgers, Lake Bluff.....1.....

## COCKEREL.

A. & E. Tarbox, Yorkville .....1.....

W. H. Millard, Genoa.....1.....

## PULLET.

A. & E. Tarbox, Yorkville.....	1.....
W. H. Millard, Genoa.....	1.....
Reliable Poultry Farm, Quincy.....	1.....

## BREEDING PEN.

A. & E. Tarbox, Yorkville.....	5.....
B. E. Rodgers, Lake Bluff.....	5.....

## SECTION 9.—WHITE WYANDOTTE.

## COCKEREL.

F. M. Munger, DeKalb.....	1.....
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## PULLET.

F. M. Munger, DeKalb.....	1.....
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## CLASS CVII.—ASIATIC.

## SECTION 1.—LIGHT BRAHMA.

## COCK.

Alfred Doyle, Morgan Park.....	1.....
L. M. Smith, Ohio.....	1.....
J. B. Foot, Norwood Park.....	1.....

## HEN.

Alfred Doyle, Morgan Park.....	1.....
J. B. Foot, Norwood Park.....	1.....
L. M. Smith, Ohio.....	1.....

## COCKEREL.

Alfred Doyle, Morgan Park.....	1.....
G. C. Griswold, Henry.....	1.....
J. F. Wolf, Bloomington.....	1.....

## PULLET.

Alfred Doyle, Morgan Park.....	1.....
G. C. Griswold, Henry.....	1.....
L. M. Smith, Ohio.....	1.....
J. F. Wolf, Bloomington.....	1.....
Reliable Poultry Farm, Quincy.....	1.....

## BREEDING PEN.

Alfred Doyle, Morgan Park.....	5.....
G. C. Griswold, Henry.....	5.....
J. B. Foot, Norwood Park.....	5.....

## SECTION 2.—DARK BRAHMA.

## COCKEREL.

A. G. Humphrey, Henry.....	1.....
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## PULLET.

A. G. Humphrey.....	1.....
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## SECTION 3.—BLACK LANGSHAN.

## HEN.

G. C. Griswold. Henry.....	1.....
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## COCKEREL.

R. T. Nettle, Peoria.....	1.....
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## PULLET.

R. T. Nettle, Peoria.....	1.....
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## SECTION 5.—BUFF COCHIN.

## COCK.

J. B. Clark, Chicago, 71 Mather St.....	1.....
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## HEN.

J. B. Clark, Chicago .....	1.....
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## PULLET.

J. B. Clark, Chicago .....1.....

## BREEDING PEN.

J. B. Clark, Chicago .....5.....

## SECTION 6.—PARTRIDGE COCHIN.

## COCK.

J. B. Foot, Norwood Park .....1.....

## HEN.

J. B. Foot, Norwood Park .....1.....

## BREEDING PEN.

J. B. Foot, Norwood Park .....5.....

A. E. Stump, Bloomington .....5.....

## SECTION 7.—WHITE COCHIN

## COCK.

C. H. Andrews, Buckley .....1.....

## HEN.

C. H. Andrews, Buckley .....1.....

## COCKEREL.

C. H. Andrews, Buckley .....1.....

## PULLET.

C. H. Andrews, Buckley .....1.....

## BREEDING PEN.

C. H. Andrews, Buckley .....5.....

## CLASS CVIII.—MEDITERRANEAN.

## SECTION 1.—S. C. BROWN LEGHORN.

## COCK.

B. E. Rodgers, Lake Bluff.....1.....

## HEN.

B. E. Rodgers, Lake Bluff.....1.....

## COCKEREL.

S. S. Noble, Bloomington.....1.....

B. E. Rodgers, Lake Bluff.....1.....

## PULLET.

S. S. Noble, Bloomington.....1.....

B. E. Rodgers, Lake Bluff.....1.....

## BREEDING PEN.

B. E. Rodgers, Lake Bluff.....5.....

## SECTION 2.—R. C. BROWN LEGHORN.

## COCK.

L. A. King, Sandwich.....1.....

## HEN.

L. A. King, Sandwich.....1.....

## COCKEREL.

P. Plummer, Prophetstown.....1.....

L. A. King, Sandwich.....1.....

## PULLET.

P. M. Plummer, Prophetstown.....1.....

L. A. King, Sandwich.....1.....

## BREEDING PEN.

L. A. King, Sandwich.....5.....

## SECTION 3.—S. C. WHITE LEGHORN.

## COCK.

W. H. Millard, Genoa.....1.....

## HEN.

Edson & White, Van Orin.....1.....

W. H. Millard, Genoa.....1.....

## COCKEREL.

Edson & White, Van Orin.....1.....

W. H. Millard, Genoa.....1.....

F. M. Munger, DeKalb.....1.....

Reliable Poultry Farm, Quincy.....1.....

## PULLET.

Edson & White, Van Orin.....1.....

W. H. Millard, Genoa.....1.....

## BREEDING PEN.

W. H. Millard, Genoa.....5.....

## SECTION 6.—BLACK LEGHORN.

## HEN.

R. E. Haeger, Algonquin.....1.....

## COCKEREL.

R. E. Haeger, Algonquin.....1.....

## PULLET.

R. E. Haeger, Algonquin.....1.....

## BREEDING PEN.

R. E. Haeger, Algonquin.....5.....

## SECTION 7.—BLACK MINORCA.

## COCKEREL.

P. M. Plummer, Prophetstown.....1.....

## PULLET.

P. M. Plummer, Prophetstown.....1.....

## CLASS CXIII.—GAMES AND GAME BANTAMS.

## SECTION 17.—CORNISH INDIAN GAME.

## COCK.

B. E. Rodgers, Lake Bluff.....1.....

A. & E. Tarbox, Yorkville.....1.....

## HEN.

A. & E. Tarbox, Yorkville.....1.....

B. E. Rodgers, Lake Bluff.....1.....

## CLASS CXVI.—TURKEYS.

## SECTION 1.—BRONZE.

## TOM.

S. H. Taylor, Sibley.....1.....

James Garvin, Princeton.....1.....

D. E. Ward, Princeton.....1.....

## HEN.

S. H. Taylor, Sibley.....1.....

## CLASS CXVII.—DUCKS.

## SECTION 1.—PEKIN.

J. B. Foot, Norwood Park.....1 pair.....

J. M. Rapp, La Moille.....1 pair.....

## CLASS CXX.—PET STOCK.

## SECTION 1.—LOP-EARED RABBITS.

Halley Lyman, Chicago.....1 pair.....

## PIGEONS.

## CLASS CXXVIII.—LONG-FACED TUMBLERS.

## SECTION 1.—MOTTLED.

J. H. Whitman, Chicago.....1 pair.....

## SECTION 2.—SADDLE.

Frank Gorse, Chicago, 71 Randolph St..1 pair.....

Ray Sturtevant, Chicago, 2950 Calumet  
Ave.....1 pair.....

## SECTION 3.—BADGE.

Frank Gorse, Chicago.....1 pair.....

“ “ .....1 pair.....

## SECTION 5.—BELL NECK.

J. H. Whitman, Chicago.....1 pair.....

Ray Sturtevant, Chicago.....1 pair.....

## SECTION 9.—ANY OTHER VARIETY.

J. H. Whitman, Chicago.....1 pair.....

## CLASS CXXX.—JACOBIANS.

## SECTION 1.—BLACK COCK.

J. H. Whitman, Chicago.....1.....

“ “ .....1.....

## SECTION 2.—YELLOW COCK.

J. H. Whitman, Chicago.....1.....

## SECTION 3.—RED COCK.

J. H. Whitman, Chicago.....1.....

“ “ .....1.....

## SECTION 4.—WHITE COCK.

Woodward & B. Jurman, Chicago, 60  
Wabash Ave.....1.....

## SECTION 5.—ANY COLOR COCK.

J. H. Whitman, Chicago.....1.....

## SECTION 6.—BLACK HEN.

J. H. Whitman, Chicago.....1.....

## SECTION 7.—YELLOW HEN.

J. H. Whitman, Chicago.....1.....

## SECTION 8.—RED HEN.

J. H. Whitman, Chicago.....1.....

“ “ .....1.....

## SECTION 9.—WHITE HEN.

Woodward &amp; B. Jurman, Chicago.....1.....

## SECTION 10.—ANY COLOR HEN.

J. H. Whitman, Chicago.....1.....

## CLASS CXXXVIII.—TURBITS.

## SECTION 1.—BLUE-WINGED COCK.

J. H. Whitman, Chicago.....1.....

## SECTION 4.—RED-WINGED COCK.

J. H. Whitman, Chicago.....1.....

## SECTION 20.—ANY OTHER COLOR HEN.

J. H. Whitman, Chicago.....1.....

## CLASS CXXXIX.—MAGPIES.

## SECTION 1.—BLACK COCK.

Robert Joos, Peoria.....1.....

## SECTION 5.—BLACK HEN.

Robert Joos, Peoria.....1.....

## SECTION 8.—ANY OTHER COLOR HEN.

Robert Joos, Peoria.....1.....

## CLASS CXLIV.—VARIOUS.

## SECTION 1.—ANTWERP, SHORT-FACED, ANY COLOR COCK.

Dr. J. W. Burns, Chicago.....1.....

## SECTION 10.—SPANGLED ICE, ANY COLOR COCK.

Woodward &amp; B. Jurman, Chicago.....1.....

## SECTION 11.—PLAIN ICE, ANY COLOR COCK.

Woodward &amp; B. Jurman, Chicago.....1.....

## SECTION 14.—ANTWERP, SHORT-FACED, ANY COLOR HEN.

Dr. J. B. Burns, Chicago.....1.....

## SECTION 17.—ARCHANGEL, ANY COLOR HEN.

Woodward &amp; B. Jurman, Chicago.....1.....

" " .....1.....

## SECTION 23.—SPANGLED ICE, ANY COLOR HEN.

Woodward &amp; B. Jurman, Chicago.....1.....

## CLASS CXLV.—HOMERS, (OPEN CLASS).

## SECTION 1,—BLUE COCK.

Dr. J. B. Burns, Chicago.....1.....

## SECTION 2.—RED OR RED-CHEQUERED COCK.

Dr. J. B. Burns, Chicago.....1.....

## SECTION 5.—ANY OTHER COLOR COCK.

Dr. J. B. Burns, Chicago, 615 Seminary  
Avenue.....1.....

## SECTION 9.—SILVER OR RED DUN HEN.

Dr. J. B. Burns, Chicago.....1.....

## SECTION 10.—ANY OTHER COLOR HEN.

Dr. J. B. Burns, Chicago.....1.....

## PREMIUMS PAID—LIVE STOCK.

EXHIBITOR.	ADDRESS.	Horses.	Jacks.	Cattle.	Sheep.	Hogs.	Poultry.	Total.
Allen, Geo.	Allerton.				20			\$735 00
Andrews, C. H.	Buckley.						9	77 67
Burgess Bros.	Wenona.	25						989 25
Benjamin, T.	Sugar Grove.			1				49 54
Bauder, F. M.	New Milford.					14		338 52
Bennett, Thos.	Rossville.					29		701 22
Burleigh & Dewey.	Mazon.			13				644 02
Brown, G. O. E.	Aurora.	20						791 40
Barton, E. M.	Hinsdale.			19				941 26
Burns Dr. J. B.	Chicago, 615 Sem. ave.						4	34 52
Boyd, John.	Elmhurst.			2				99 08
Boekthoff, T.	Watseka.	1						39 57
Brown, L. W. & Son	New Berlin.			10				495 40
Bourquin, A.	Nokomis.		9	11				544 94
Converse Bros.	Springfield.							356 13
Clark, Thos.	Beecher.			10				495 40
Clarke, S. P.	Dover.			14				693 56
Chapman, A. P.	Sugar Grove.					21		507 78
Cass & Burns.	Buffalo Hart.					13		314 34
Crum Bros.	Literberry.	5						197 85
Cobb, E.	Kankakee.			1				49 54
Clark, J. B.	Chicago, 71 Mather st.						8	69 04
Curnutt, J. W.	Greenfield.			1				49 54
Dunham, M. W.	Wayne.	108						4,273 56
Davis, S. A.	Geneva.	1						39 57
Dorsey, B. F. & Sons.	Perry.	3				52		1,376 07
Danforth Bros.	Deer Creek.					12		290 16
Doyle, Alfred.	Morgan Park.						9	77 67
Fry, Wm.	El Paso.	1						39 57

Fluck, H. J.	Goodenow.	5	247	70
Fisher, O. W.	Assumption.	9	445	86
Foot, J. B.	Norwood Park.	18	155	34
Green Bros.	Indianola.	10	495	40
Griswold, G. C.	Henry.	10	86	30
Garvin, James	Princeton.	1	8	63
Gorse, F. W.	Avondale.	4	34	52
Hodgson, Ed.	El Paso.	23	911	11
Hudson, John	Moweaqua.	27	1,337	58
Holloway, Robt.	Alexis.	34	1,345	38
Hopkins, A. W.	Peru.	1	197	85
Haeger, R. E.	Algonquin.	10	86	30
Humphrey, A. G.	Henry.	2	17	26
Hodgson, H.	Albion.	2	17	26
Hunt, T. W.	Ashton.	3	148	62
Jones, M. E.	Williamsville.	9	445	86
Joos, R.	Peoria.	6	51	78
King, L. A.	Sandwich.	9	77	67
Lovejoy, A. J.	Roscoe.	11	265	98
Latimer & Miller.	Abingdon.	10	495	40
Miller, E.	Ancona.	8	316	56
Munroe, C. G.	Rushville.	2	79	14
Morgan Horse Co.	Carpentersville.	11	435	27
Mariwether, E. G.	Shipman.	1	49	54
Millard, W. H.	Genoa.	13	112	19
McWilliams, J. P.	Auburn.	1	39	57
Munger, F. M.	Dwight.	9	356	13
Newburn, M. E.	DeKalb.	4	34	52
Nettle, R. T.	Hennepin.	16	386	88
Noble, S. S.	Peoria.	7	60	41
Oltmanns Bros.	Bloomington.	4	34	52
Pierce, B. R.	Watseka.	10	395	70
Poppen, Ulfert	Creston.	9	445	86
Parker Bros.	German Valley.	8	316	56
	Wyoming.	1	39	57

*Premiums Paid, Live Stock—Continued.*

EXHIBITOR.	ADDRESS.	Horses.	Jacks.	Cattle.	Sheep.	Hogs.	Poultry.	Total.
Potts & Son, J. H.	Jacksonville			17	22			\$1,550 68
Peck & Son, E.	Geneva				43		17	1,726 96
Ponting, T. C.	Moweaqua			3				148 62
Peak & Son, J. R.	Winchester	6						237 42
Plummer, P. M.	Prophetstown.						5	43 15
Powell S. R.	Peoria	1						39 57
Pratt, C. B.	Chicago	1						39 57
Rodgers, J. J.	Abingdon.							495 40
Rodgers, B. E.	Lake Bluff			10			27	233 01
Rapp, J. M.	La Moille.						6	51 78
Reliable Inc. Co.	Quincy						9	77 67
Smith, E. B.	Chicago	1						39 57
Soderberg, A. G.	Osco	3						118 71
Stetson, J. M.	Neponset.	2						79 14
Stonebraker, J. M.	Panola					14		338 52
Stone & Harris	Stonington.				25			918 75
Stericker Bros.	Springfield.	14						553 98
Smith, S. M.	Ohio						3	25 89
Stump, A. E.	Bloomington						5	43 15
Sturtevant, Ray	Chicago						3	25 89
Trone, Geo. W.	Rushville					13		314 34
Taylor, H. H.	Heyworth					6		145 08
Taylor, Thos.	Waverneville					8		193 44
Tarbox, A. & E.	Yorkville						13	112 19
Varnet, J. D.	Indianola.			8				396 32
Von Beidenfeld, H.	Granville.	1						39 57
Ward, D. E.	Princeton.						1	8 63



## REPORT OF THE CUSTODIAN OF THE ILLINOIS BUILDING.

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**T**HE plan of exhibit was departmental and illustrative of the administration of the State. The several departments were intrusted to competent committees, and their reports show fully the manner in which the several representations of the departments of the State Government were administered.

Seats were provided in sufficient quantities to accommodate visitors, in order that they might rest in comfort, eat lunch, etc., although this entailed a very considerable amount of additional labor in keeping the Building in presentable condition. The dispensers of milk, lemonade and other similar beverages were compelled to charge but five cents per glass, while ten and even fifteen cents were common charges elsewhere on the grounds. Check rooms for lunch baskets, clothing, grips, etc., were provided free of charge, and parlors and reception rooms were at all times open for the comfort of visitors. The greatest care was exercised to properly and promptly return lost or stolen property.

By resolution of the Board the employés needed in this department were selected from the various congressional districts of the State, each being recommended and vouched for by the representative on the Board from his district. As a consequence, an exceptionally competent and efficient body of men was secured, whose main labors were performed during the night when the Building was closed, and who were as a result at liberty during the day to render valuable service in conducting and entertaining visitors.

At the close of the Fair the Building and all property not otherwise disposed of by grants to the public institutions of the State were sold at public auction after extended public notice of the same in several newspapers of general circulation, and brought satisfactory prices, considering the circumstances of the sale.

All of which is respectfully submitted,

W. H. FULKERSON,  
*Custodian Illinois Building.*

## REPORT OF THE COMMITTEE ON RECEPTION AND CEREMONIES.

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**Y**OUR Committee on Reception and Ceremonies would respectfully report that the important and delicate duties assigned them were discharged with a full appreciation of the dignity of the great State which the Board represented, and the historical character of the occasions upon which its hospitalities and courtesies were extended.

Bearing constantly in mind the plain and unassuming character of our people, no attempt was made to imitate the customs and ceremonials of the Old World, but to dispense an abundant and generous hospitality after the manner to which our people have been accustomed. It affords me great pleasure to say that this method seemed to meet the hearty approval, not only of our own people, but of our honored guests from foreign lands.

By the aid of various members of the Board and others, the committee was enabled to render every public reception a gratifying success, and to give such an account of this department as would redound to the honor of the commonwealth.

On May 18, Dedication Day, the attendance was very large, and the Illinois Building was, of course, the center of attraction. For the entertainment of the multitude, speeches were made by President Funk, of the Board, Governor Altgeld, Hon. Frank H. Jones, of Springfield, who was the orator of the day, Mayor Harrison, of Chicago, and others; and the Building and the Illinois Exhibit were formally opened to the public.

At the close of the dedicatory exercises, luncheon was served in the Assembly Room of the Illinois Building to more than twenty-four hundred people.

A reception was given by the Board on July 26, to which all the Commissioners—national, foreign, and State Boards of Control—were invited, and the occasion was memorable for pleasant social intercourse, speeches, toasts and music.

We also entertained, August 24, Illinois Day, the assembled multitudes, listening to speeches by Vice President Stevenson, Governor Altgeld, Mayor Harrison, and other noted representative gentlemen, on which occasion the Illinois National Guard was present, adding greatly to the impressiveness of the occasion. The Building was handsomely decorated with the national colors and the flags of foreign nations, from base to dome, and the day closed with a grand display of fireworks in the evening.

Chicago Day, October 9, was the crowning day of the World's Fair. More people visited Jackson Park than were ever seen on any fair ground in the world before, and the Illinois Board of World's Fair Commissioners did their part ably in entertaining the immense throng. The Building was elaborately decorated with the national colors, as well as those of foreign nations, and made an imposing appearance. In the evening our grounds were brilliantly lighted with thousands of Chinese lanterns. A brilliant reception was held by Governor Altgeld.

It is with great pleasure that we recall the entertainment given under the auspices of the Illinois Board to the children of the Soldiers' Orphans' Home at Normal, Ill., October 23, the number of children and their attendants being about two hundred and seventy. A special train was chartered by the Board over the Chicago & Alton Railroad, from Normal to Jackson Park and

return. Their admission was paid at the gate, their meals paid for at the Wellington Catering Company's dining-rooms, and they were comfortably and safely lodged in the Illinois Building—the boys and their attendants in the Assembly Room, and the girls and their female attendants in the private parlors, General Orendorff furnishing blankets for the boys, and Marshall Field & Co. furnishing, free of cost, four hundred and eighty new blankets for the girls. The children finished their sight-seeing by accepting the generous invitation of Col. W. F. Cody to attend the Wild West Show, and a happier lot of little ones were never seen.

November 18th there was an entertainment given by the Illinois Board to the executive officers of the different States, which was a kind of last greeting—a sort of love feast—which was enjoyed exceedingly by all present.

All of which is respectfully submitted.

JAMES W. JUDY,

*Chm. Com. on Reception and Ceremonies.*

## REPORT OF COMMITTEE ON BUREAU OF INFORMATION.

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YOUR Committee assigned to the charge of the "Bureau of Information," respectfully report: That, after carefully considering this matter, with the great interests at stake, and the absolute necessity of placing it in charge of a gentleman thoroughly acquainted with the magnitude of the department, and one who would be able to wield its influence in the interest of the great enterprise in hand, unanimously selected Hon. Joseph M. Page, of Jerseyville, Illinois, as such manager, conferring upon him authority to conduct, with the advice and consent of the Committee, the business pertaining to the position. That he faithfully and intelligently performed such duties, the *Press*, not only of our State, but of the whole country, abundantly testify. The headquarters was the rendezvous of the newspaper men from far and near, and it was so well equipped with information on all subjects of interest to the visitor, as to elicit the highest encomiums of praise. To Mr. Page your Committee feel under great obligations, and we feel that the favorable impressions made in favor of the work of the Commission, were largely due to his efforts.

We submit with this his detailed report, which is made a part of the report of your Committee.

All of which is respectfully submitted,

E. C. PACE.

*Chairman.*

## **Bureau of Information.**

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**J. M. PAGE, SUPERINTENDENT.**

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As your Honorable Board is well aware, the Press Department for the State was organized by your Commission, and placed in charge of a committee consisting of E. C. Pace, chairman; J. W. Judy and William Stewart, and an appropriation of \$5,000 made for carrying out the purposes of said department. The Committee so appointed employed J. M. Page, of Jerseyville, and placed the department in his charge with full power to transact the business pertaining thereto, and to make such purchases as were in his judgment required, that would meet with the approval of the Board, and I beg leave to submit the following report, which, in a measure, shows what has been done through the Press Department.

Your Honorable Board, feeling that Illinois was the host of the nations, requested that newspaper men not only from this State, but from all the States and from all countries, should be courteously treated and entertained. To do this in a manner befitting the State I purchased carpets, decorations, furniture and papering amounting to \$885.04, and have kept a full supply of stationery, which has been used by all visitors without expense to them. I also engaged two assistants and a stenographer for the purpose of better attending to the business of the department.

In the early days of the Fair indications were that the people of this State especially were not being made fully conversant with the grandeur of the exhibits, and on consultation with your Honorable Board it was deemed

advisable that a Press Day be named which would be devoted to the newspaper men of the State. This day was set for the 16th of June. Invitations were issued to all the newspapers of the State, and a large number of editors met here on that day, and by personal inspection of the Illinois Building and exhibits, carried back with them and told their readers just what they had seen. I think you are all convinced this resulted in great good to the Fair and in bringing the work of this Honorable Body to the attention of the citizens of Illinois, who had so generously contributed towards the enterprise, and I have yet to hear a single complaint made by the newspaper men of the manner in which the funds and exhibits have been handled by you. It was thought best to provide a luncheon for the newspaper men and the members of their families attending on that day, and a contract was made by me with the Wellington Catering Company to provide suitable food for fifteen hundred at an expense of \$800. The compensation for management arranged for with the Committee was \$300 per month for myself and the two assistants above mentioned, and the stenographer at \$50 per month. The total amount expended, including all expenses to November 1, has been \$3,991.88, leaving of the \$5,000 appropriated, the sum of \$1,008.12; and in addition to that the carpets and furniture can be sold for at least fifty per cent. of their first cost, making the net cost of furnishing and maintaining the Press Department, including the \$800 for lunch on Illinois Day, the sum of \$3,606.88.

It has been impossible to keep a correct record of the number of visitors who have come to the press rooms and enjoyed its hospitalities, as scarce one in ten of the editors registered.

The work, in a great measure, outside of entertaining visitors, has consisted in securing passes for admission

through the gates, and also to the various entertainments in the city and upon the Fair Grounds, and I think I can safely say that, counting it in single admissions, there have been issued through this department over forty-five thousand tickets into the grounds, and that the places of entertainment before referred to have admitted upon my personal card no less than ten thousand persons. In addition to this, a large number of circulars have been sent out from this office to the newspapers of the State, and arrangements made with the ready print publishers of country newspapers by which a cut of the farm scene in the Illinois Building was sent broadcast throughout the State, with three columns of reading matter attached thereto. I have also distributed one hundred copies of the Illinois Souvenir Book to the managers of the entertainments in Midway and several of the natives of foreign countries in these places, with a slip on which was written the names of your Honorable Board, and feel that this book will be productive of great good by reason of its being taken into so many foreign countries, and cherished as a souvenir by the recipients.

Whether the department has been well conducted and satisfactory to your Honorable Board is not for me to say, but I wish to extend to you all my sincere thanks for the friendly feeling ever shown to me and those under me, and for the hearty coöperation you have extended on every occasion when requested by me so to do, and I hope that the friendly relations and new acquaintances formed may ever be pleasant and lasting.

## REPORT OF FREIGHT AND EXPRESS RECEIPTS AND SHIPMENTS.

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W. D. STRYKER, SUPERINTENDENT.

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**I** HAVE the honor, as Commissioner in charge of freight and express receipts and shipments, respectfully to report that I was appointed to take charge of this department on February 10, 1893.

During the month of March there were received by express nineteen packages, consigned chiefly to the common school section of the Educational and the Agricultural Departments. By freight twenty-three packages and six car loads, consigned chiefly to the Agricultural Department and that of interior furnishings.

During the month of April there were received by express one hundred and one packages for the common school section of the Educational Department and one hundred and two for various other departments. By freight, one hundred and eighty-nine pieces and three car loads.

In May there were received twenty-nine packages for the common school section of the Educational Department, and one hundred and sixty-nine for other departments. By freight, eight pieces.

In June there were received fifty-eight packages for the common school section of the Educational Department and two hundred and twenty-five for other departments, by express. By freight, thirty pieces.

During the month of July there were received sixty-two packages for various departments by express.

In August there were received sixty-two packages by express for various departments, and by freight sixty consignments for the Live Stock Exhibit.

In September there were received eighty-four packages by express; by freight, seventeen consignments for the Live Stock Exhibit.

In October ninety-one packages by express, sixty-three for various departments and twenty-eight for the Poultry Exhibit. By freight, fourteen consignments.

There was shipped matter to the number of seventy-one packages by express, prior to November 1st, including principally circulars of information.

During November there was shipped by express matter to the number of three hundred and six packages by the American Express Company, fifty-seven by the Adams and one hundred sixty-eight by the Associated Express Company, making a total for the month of five hundred and thirty-one packages.

In December there was shipped by express nineteen packages.

In January there were shipped by express fourteen packages, and seven car loads of interior furnishing, etc., were delivered to the Illinois State Board of Agriculture.

This report is unavoidably incomplete, for a considerable quantity of freight and express matter was delivered directly to the heads of departments, and no report thereof could in many cases be obtained for this department.

It would have been possible to go into greater detail, but not apparently to any good purpose. The work, therefore, which extended over a period of nearly a year, needing daily and often hourly attention, is condensed into this brief summary, which is now respectfully submitted.

## REPORT OF PRINTING COMMITTEE.

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**T**HE act creating the Illinois Board of World's Fair Commissioners was approved June 17, 1891, and upon organization of the Board, the following members were selected for the Standing Committee on Printing: James K. Dickirson, Samuel Dysart, E. B. David, J. M. Washburn and George S. Haskell. The latter gentleman died, and soon after his place on the committee was filled by the appointment of J. Harley Bradley.

The sum of \$30,000 was set aside by the Board, to be expended by this Committee in the publication of such matter as might subsequently be agreed upon. The work of the Printing Committee was done under the direction and by the order of the Board of Commissioners, and the Committee is gratified that everything has proved satisfactory.

Among the publications made by the Printing Committee were 10,000 circulars, giving the growth of the public schools from 1855 to 1892, and a Synopsis of the Public School System of Illinois, with the pertinent statistical features of the educational system of this State, which is, without doubt, the finest and best in the world.

The Committee also published separate pamphlets, giving the history, progress and condition of each of the eleemosynary institutions in the State. These gave information that has been called for from all parts of the world, concerning the methods of our charitable and educational work by the State. These pamphlets were furnished gratis to all who visited the exhibits made by

the different institutions, in the Illinois Building at the Columbian Exposition, and were afterwards bound in volumes that make a beautiful and valuable souvenir book, being elaborately illustrated with exterior and interior views of the several buildings. Sixteen thousand copies of these were printed.

The Committee also issued sixteen thousand copies of the Illinois Building Souvenir Book, which gives a description of the resources of the State, as shown in the great State Building. It was written as a guide or index to the grand exhibit made by the Prairie State, which formed a very interesting and important portion of the World's Columbian Exposition. This book is embellished with excellent half-tone engravings of the officers and members of the Illinois Commission, and full page views of the Illinois Building, the great Relief Map of the State, the Agricultural Art Picture, grain inspection and forestry; the agricultural, horticultural and floricultural exhibits; those of the timber, fish, clay, geology, archæology, natural history; the educational display, including numerous views of the exhibit made by the University of Illinois, the different Normal Schools and public buildings, including the four different places that have been occupied as the seat of government in Illinois.

In addition to all these, the Committee has issued the printed matter documents required by the Board of Commissioners during the year 1893, and yet, with economical and judicious management, the committee leaves an amount of about \$21,565.84 of the appropriation for a printing fund still unexpended.

Appropriation .....	\$30,000.00
Expended .....	8,434.16
	<hr/>
Balance .....	\$21,565.84

Respectfully submitted,

J. K. DICKIRSON,  
E. B. DAVID,  
SAMUEL DYSART,  
JAS. M. WASHBURN.  
*Committee.*

## REPORT OF COMMITTEE ON TRANSPORTATION.

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**Y**OUR Committee on Transportation begs leave respectfully to report:

That the thanks of this Board are respectfully and cordially tendered to the railroads of Illinois for unfailing courtesy in all legitimate and proper ways extended to this Commission during the preparation for and continuance of the World's Columbian Exposition.

Respectfully submitted,

J. IRVING PEARCE,

*Chairman Committee on Transportation.*

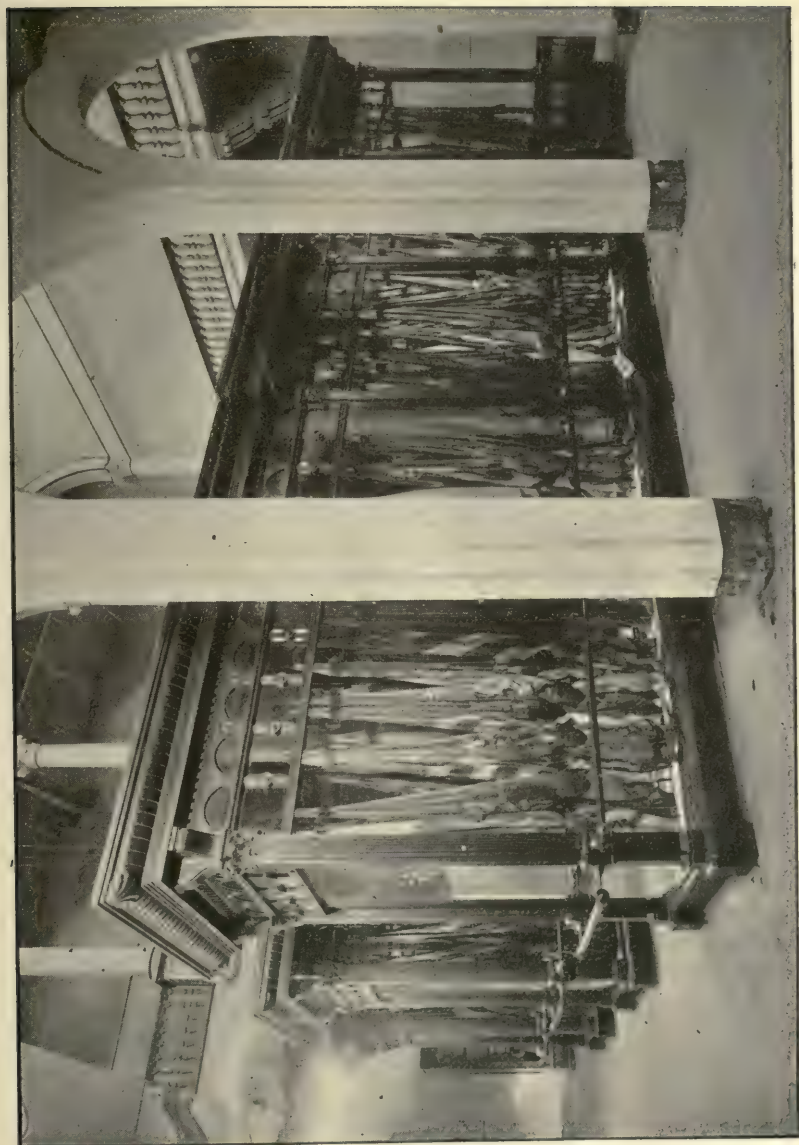
## REPORT OF COMMITTEE ON COMPENSATION.

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**A**UGUST 5, 1891, your Committee on Compensation made their report to your honorable body, which your records will show. Since then they have been relieved from any active service, the Board assuming the responsibility of fixing compensation for members and employés.

J. IRVING PEARCE,  
B. PULLEN,  
D. W. VITTUM,  
*Committee on Compensation.*





MEMORIAL HALL.



REPORT  
OF  
FINANCE COMMITTEE.

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**T**HE Committee on Finance herewith submits a classified statement of the expenditures incurred by the Illinois Board of World's Fair Commissioners, in all of the departments.

Respectfully submitted,

WM. STEWART,

*Chairman.*



# FINANCIAL STATEMENT.

## General Fund.

Voucher.	To Whom Paid.	Amount.
15	American Desk and Seating Co.....	\$70 00
121	" ".....	10 00
2095	Anderson Bros. & Co.....	17 84
25	Andrews, A. H. & Co.....	242 25
780	" ".....	8 00
2704	" ".....	8 64
2032	Armour & Co.....	1,300 00
2064	Automatic Fountain Co.....	10 00
2137	Allen, F. S.....	203 00
28	Buckles, W. H.....	7 00
701	Bidenger, J.....	2 86
1191	" ".....	1 04
794	Bennett, Geo.....	3 12
1395	Bartels, W. H.....	264 59
1657	Bates, G. G.....	2 25
2105	Butler, W. P.....	318 40
2122	Beck, A. R., Lumber Co.....	53 33
2482	Baker, A. H.....	5 00
1696	Bullard & Gormley.....	27 00
2100	Bushnell, G. W.....	194 20
2742	Bunn, Jno. W.....	51 40
2658	Brennan, Thos.....	54 00
2774	Blakeslee, Helen.....	40 00
2106	Case, W. C.....	12 00
2700	Chicago Herald.....	34 00
1912	Crawford, C. F.....	30 00
2702	Coons, J. P.....	1 00
68	Chicago Directory Co.....	6 00
901	" ".....	7 50
2119	Cook, E. C. & Co.....	200 00
2166	" ".....	220 00
2103	Clark W. M.....	3 22
2728	Chicago & Northwestern Ry.....	5 60
662	Cunningham, M. B.....	10 00
397	Carl Young Transfer Co.....	15 70
461	" ".....	10 00
2099	Chicago Calcium Light Co.....	206 00
979	Carter, D. S.....	20 00
2527	Cook & Rathbun.....	9 00
1965	Devoe & Reynolds.....	6 50
2191	Dynes, J.....	300 00
2290	" ".....	5 00
2033	Drake, F. B.....	28 00
2071	Dernberg, Glick & Co.....	11 15

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
2188	Dennison Manufacturing Co.....	\$13 50
1777	Ellison Flersheim & Co.....	39 60
1794	Foote, A. E.....	5 00
2102	Fay, O. H.....	300 00
2104	Ferris, J. A.....	11 00
2112	".....	3 00
1689	Fair, The.....	3 95
1852	".....	4 91
2138	Gillett, L. H.....	15 00
2096	Gilmore, C. O.....	2 25
1624	Goodyear Rubber Co.....	17 60
2031	Greer, Robt.....	3,814 25
2326	Gore, T. K.....	22 50
2109	Green, J. W.....	76 85
2680	Gurley, W. F. E.....	7 50
1792	Gilbert, F. F.....	39 60
2431	Geserich, H.....	17 77
2772	Gardner, C. P.....	26 00
2788	Halliday & Kessberger.....	1 00
2397	Hemmick, Maud.....	36 66
1005	Herbst, A. J., & Co.....	1 70
1356	".....	2 75
2111	Hoeg, C. M.....	5 40
1779	Hackett, W. H.....	115 00
2009	Heath & Milligan.....	4 15
2083	Higgins, Todd & Co.....	18 00
2654	Henry, Geo. B.....	69 00
37	Hiff, G. D.....	10 00
2118	Judd, L. S.....	70 00
2679	Jenkins, Wm.....	21 45
2710	".....	200 00
2711	".....	24 10
2783	".....	288 98
47	Johnson, J. S., Ford & Co.....	194 90
650	Johnson, J. H.....	3 20
846	".....	1 60
1144	".....	1 60
2101	Jones Bros.....	5 65
2391	Johnston, W. J.....	22 95
2740	Jewell, O. H., Filter Co.....	21 00
1353	Kilbride, Thos.....	2 50
2093	Koch, C. R. E.....	72 50
2491	Kahl, Hugo.....	45 00
2779	Kirk, W. R.....	2 90
1855	Lansing Wheelbarrow Co.....	13 00
1973	Lloyd, E. S.....	2 90
1998	Lewis, W. H.....	65 00
1999	".....	65 00
2065	Lord, Owen & Co.....	3 00
2107	Lino, Paul B.....	145 80

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
2428	Loy, D. O. ....	\$100 00
2703	Leland Hotel. ....	9 75
2741	" .....	82 00
2744	" .....	8 75
2771	" .....	85 00
2784	" .....	28 00
2712	Lindahl, Josua. ....	100 00
2097	Muller, K. P. ....	11 75
39	McClurg, A. C., & Co. ....	20 00
1778	McAdams, Wm. ....	100 00
1911	Mitchell, H. R. ....	100 00
2726	McCoy, E. E. ....	32 00
2777	" .....	20 00
2696	Orendorff, H. ....	98 50
2393	Paddock, D. H. ....	100 00
1692	Pitkin & Brooks. ....	11 84
2214	Portable Chair Co. ....	5 40
1695	Palmer, Fuller & Co. ....	2 25
2011	" .....	16 00
2413	Pettibone, Wells & Co. ....	135 60
1878	Rosette, Clinton. ....	47 50
1879	" .....	47 50
263	Revell, A. H. & Co. ....	6 00
1940	Ransom, Caroline. ....	46 75
1733	Reidle, Florence. ....	30 45
1865	" .....	42 00
69	Rand, McNally & Co. ....	1 00
93	" .....	12 00
1346	Remington, A. H. ....	133 33
1474	" .....	83 33
2713	Reed, N. B. ....	1 29
2008	Roberts, Bros. ....	24 00
2108	Schaffinger & Haan. ....	34 20
2399	Smiley, C. H. ....	113 67
1793	Sherrard & Co. ....	150 00
2787	Springer & DuBois. ....	20 00
29	Springer, Annie G. ....	3 25
2110	Smith Premier Typewriter Co. ....	2 00
1697	Sefton Bros. ....	25 65
2123	Salzenstein, E. ....	693 20
2182	Stubbings, W. H. & Co. ....	250 00
1691	Summerfield, E. H. ....	7 00
1857	Schlesinger & Mayer. ....	64 00
2066	" .....	66 00
1205	Salisbury, W. H. & Co. ....	24 15
2197	South Chicago Ice Co. ....	3 60
2286	Steiner & Reed. ....	22 00
2532	Shattuck, S. W. ....	3 55
2660	" .....	40 00
2701	" .....	15 00

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
2648	Seeberger, A. F.....	\$379 80
2651	St. Nicholas Hotel.....	8 00
2736	".....	19 50
2789	".....	26 25
2695	Springfield Carpet Co.....	25 00
2753	State Board of Agriculture.....	25 00
1880	Tinney, C. M.....	21 25
1881	".....	21 25
1964	Tomaso, S.....	27 00
2010	Turnbull & Cullerton.....	22 70
1479	Tobey Furniture Co.....	42 50
1752	Ure, John C.....	22 50
1945	".....	25 00
2780	Udden, J. A.....	8 50
1358	Vance, J. W.....	128 00
1814	Woodruff & Hanchett.....	30 00
2481	Waukesha Mineral Spring Co.....	10 00
2121	Wheeler, H. A.....	45 00
205	Wiggins, N. B.....	52 50
1908	".....	30 00
2791	Western Photo-Engraving Co.....	25 50
2390	Wausau Excelsior Co.....	12 00
1632	Wilcox, W. W.....	20 00
1415	White, Wm. Sons.....	600 00
2653	".....	600 00
2094	Withington, H.....	3 00
2699	Wilbur, R. S.....	39 50
1736	Yale Towne Manufacturing Co.....	16 30
2098	Yeager, Phil.....	181 78
2168	Zahnd, Jacob.....	60 00
2785	Zeese, A., & Sons.....	13 50
2790	".....	13 75
	Total.....	\$15,625 30
5	J. Harley Bradley, per diem and expenses.....	\$27 00
280	" " ".....	30 00
817	" " ".....	79 10
911	" " ".....	21 00
1734	" " ".....	88 15
2015	" " ".....	375 00
2090	" " ".....	125 00
2174	" " ".....	125 00
2346	" " ".....	126 50
2488	" " ".....	139 87
2738	" " ".....	10 70
2764	" " ".....	15 00
2776	" " ".....	10 00
	Total.....	\$1,172 32

## General Fund—Continued.

Voucher.	To Whom Paid.	Amount.
1	E. E. Chester, per diem and expenses.....	\$25 00
61	" " " ".....	43 00
127	" " " ".....	48 00
214	" " " ".....	33 25
324	" " " ".....	20 00
465	" " " ".....	51 00
577	" " " ".....	10 00
751	" " " ".....	31 00
816	" " " ".....	46 25
921	" " " ".....	20 00
988	" " " ".....	30 00
1188	" " " ".....	22 35
1325	" " " ".....	15 00
1488	" " " ".....	68 75
1681	" " " ".....	152 10
1833	" " " ".....	150 24
1961	" " " ".....	154 00
2053	" " " ".....	150 55
2154	" " " ".....	157 45
2344	" " " ".....	163 15
2417	" " " ".....	156 70
2508	" " " ".....	47 70
2666	" " " ".....	17 40
2725	" " " ".....	93 00
2748	" " " ".....	20 00
2755	" " " ".....	10 00
Total .....		\$1,675 89
7	Sam'l Dysart, per diem and expenses.....	\$30 00
73	" " " ".....	20 00
133	" " " ".....	60 50
207	" " " ".....	30 00
325	" " " ".....	40 00
449	" " " ".....	20 00
576	" " " ".....	22 75
702	" " " ".....	15 00
819	" " " ".....	65 00
980	" " " ".....	40 00
1168	" " " ".....	40 00
1287	" " " ".....	25 00
1496	" " " ".....	107 60
1680	" " " ".....	204 80
1871	" " " ".....	205 00
1960	" " " ".....	199 35
2043	" " " ".....	198 15
2146	" " " ".....	201 85
2308	" " " ".....	164 30
2466	" " " ".....	138 48
2514	" " " ".....	53 06

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
2676	Sam'l Dysart, per diem and expenses.....	\$19 45
2724	" " " " .....	50 00
2768	" " " " .....	74 50
	Total .....	\$2,024 79
10	Jas. K. Dickirson, per diem and expenses.....	\$44 60
92	" " " " .....	54 50
125	" " " " .....	26 75
216	" " " " .....	28 00
322	" " " " .....	27 75
448	" " " " .....	23 75
580	" " " " .....	40 50
703	" " " " .....	22 50
820	" " " " .....	104 50
992	" " " " .....	77 75
1206	" " " " .....	70 00
1489	" " " " .....	40 15
1699	" " " " .....	198 65
1841	" " " " .....	207 60
1957	" " " " .....	210 00
2056	" " " " .....	209 50
2148	" " " " .....	209 50
2330	" " " " .....	168 40
2464	" " " " .....	140 90
2664	" " " " .....	80 80
2706	" " " " .....	15 35
2750	" " " " .....	50 10
	Total .....	\$2,026 55
19	E. B. David, per diem and expenses.....	\$39 00
66	" " " " .....	20 50
124	" " " " .....	60 00
271	" " " " .....	44 00
377	" " " " .....	69 90
500	" " " " .....	29 50
770	" " " " .....	30 50
824	" " " " .....	91 85
971	" " " " .....	51 50
1147	" " " " .....	91 50
1254	" " " " .....	84 85
1494	" " " " .....	96 85
1787	" " " " .....	170 35
1863	" " " " .....	176 70
1947	" " " " .....	181 30
2059	" " " " .....	163 54
2187	" " " " .....	176 15
2368	" " " " .....	173 95
2423	" " " " .....	163 70
2640	" " " " .....	33 40

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
2709	E. B. David, per diem and expenses.....	\$57 25
2732	“ “ “ .....	4 50
2752	“ “ “ .....	45 50
Total .....		\$2,056 34
56	W. H. Fulkerson, per diem and expenses.....	\$61 25
112	“ “ “ .....	54 90
219	“ “ “ .....	35 50
450	“ “ “ .....	61 85
572	“ “ “ .....	17 70
746	“ “ “ .....	20 50
807	“ “ “ .....	75 00
984	“ “ “ .....	17 75
1159	“ “ “ .....	64 35
1288	“ “ “ .....	72 65
1498	“ “ “ .....	99 95
1676	“ “ “ .....	225 80
1834	“ “ “ .....	220 90
1954	“ “ “ .....	206 95
2055	“ “ “ .....	225 10
2140	“ “ “ .....	227 45
2306	“ “ “ .....	220 60
2418	“ “ “ .....	156 65
2511	“ “ “ .....	47 70
2656	“ “ “ .....	2 85
2670	“ “ “ .....	15 45
2693	“ “ “ .....	18 00
2754	“ “ “ .....	30 00
Total .....		\$2,178 85
4	LaFayette Funk, per diem and expenses.....	\$37 25
71	“ “ “ .....	20 00
163	“ “ “ .....	72 89
305	“ “ “ .....	25 75
562	“ “ “ .....	37 05
745	“ “ “ .....	36 04
986	“ “ “ .....	120 15
1176	“ “ “ .....	54 85
1260	“ “ “ .....	67 15
1550	“ “ “ .....	92 11
1675	“ “ “ .....	134 90
1843	“ “ “ .....	133 75
1995	“ “ “ .....	133 15
2091	“ “ “ .....	135 65
2172	“ “ “ .....	137 75
2396	“ “ “ .....	141 35
2467	“ “ “ .....	132 10
2513	“ “ “ .....	48 08
2678	“ “ “ .....	27 46

## General Fund—Continued.

Voucher.	To Whom Paid.	Amount.
2692	LaFayette Funk, per diem and expenses.....	\$12 03
2718	“ “ “ .....	12 28
2769	“ “ “ .....	20 60
2775	“ “ “ .....	10 00
	Total .....	\$1,622 34
1552	LaFayette Funk, amount drawn to pay employés	\$93 34
1740	“ “ “ .....	240 15
1795	“ “ “ .....	25 13
1859	“ “ “ .....	225 32
1905	“ “ “ .....	103 16
1962	“ “ “ .....	594 13
2036	“ “ “ .....	174 47
2114	“ “ “ .....	120 78
2181	“ “ “ .....	39 80
2207	“ “ “ .....	163 07
2287	“ “ “ .....	92 35
2473	“ “ “ .....	282 96
	Total .....	\$2,154 66
16	W. C. Garrard, salary and expenses .....	\$22 75
17	“ “ “ .....	100 00
30	“ “ “ .....	12 00
34	“ “ “ .....	100 00
53	“ “ “ .....	100 00
67	“ “ “ .....	32 15
77	“ “ “ .....	100 00
105	“ “ “ .....	100 00
114	“ “ “ .....	23 25
153	“ “ “ .....	100 00
162	“ “ “ .....	21 00
195	“ “ “ .....	100 00
213	“ “ “ .....	13 50
255	“ “ “ .....	100 00
262	“ “ “ .....	19 05
299	“ “ “ .....	100 00
307	“ “ “ .....	13 10
361	“ “ “ .....	100 00
368	“ “ “ .....	15 10
413	“ “ “ .....	100 00
451	“ “ “ .....	21 60
459	“ “ “ .....	9 76
484	“ “ “ .....	100 00
497	“ “ “ .....	12 69
551	“ “ “ .....	100 00
567	“ “ “ .....	25 37
637	“ “ “ .....	100 00
678	“ “ “ .....	24 85
691	“ “ “ .....	100 00

## General Fund—Continued.

Voucher.	To Whom Paid.	Amount.
738	W. C. Garrard, salary and expenses.....	\$14 75
783	" " " ".....	100 00
840	" " " ".....	25 30
859	" " " ".....	100 00
873	" " " ".....	27 00
952	" " " ".....	118 10
1029	" " " ".....	100 00
1062	" " " ".....	26 80
1130	" " " ".....	100 00
1192	" " " ".....	17 50
1229	" " " ".....	100 00
1297	" " " ".....	18 75
1381	" " " ".....	100 00
1473	" " " ".....	22 23
1651	" " " ".....	100 00
1682	" " " ".....	28 48
1828	" " " ".....	100 00
1831	" " " ".....	38 50
1949	" " " ".....	21 65
2063	" " " ".....	33 80
2147	" " " ".....	31 75
2323	" " " ".....	29 20
2459	" " " ".....	23 40
2506	" " " ".....	28 70
2659	" " " ".....	115 30
2773	" " " ".....	100 00
Total .....		\$3,287 38
26	W. C. Garrard, amount paid for office sundries. .	20 00
202	" " " ".....	20 00
391	" " " ".....	50 00
278	" " " ".....	6 82
849	" " " ".....	15 00
914	" " " ".....	5 00
935	" " " ".....	10 00
Total .....		\$126 82
64	David Gore, per diem and expenses.....	\$43 50
109	" " " ".....	78 50
234	" " " ".....	79 00
323	" " " ".....	29 50
454	" " " ".....	31 25
570	" " " ".....	27 50
705	" " " ".....	28 00
910	" " " ".....	39 00
1089	" " " ".....	59 00
2309	" " " ".....	770 20
2465	" " " ".....	140 10
2519	" " " ".....	20 60

## General Fund—Continued.

Voucher.	To Whom Paid.	Amount.
2665	David Gore, per diem and expenses.....	\$10 50
2715	" " " " .....	10 00
2718	" " " " .....	20 00
	Total .....	\$1,386 65
11	A. B. Hostetter, per diem and expenses.....	\$20 75
58	" " " " .....	15 75
110	" " " " .....	38 00
164	" " " " .....	31 75
226	" " " " .....	5 00
260	" " " " .....	20 75
308	" " " " .....	15 00
367	" " " " .....	26 75
463	" " " " .....	10 75
582	" " " " .....	10 00
653	" " " " .....	23 30
904	" " " " .....	30
905	" " " " .....	70 70
978	" " " " .....	40 65
1149	" " " " .....	45 00
1300	" " " " .....	25 35
1493	" " " " .....	59 00
1679	" " " " .....	203 67
1874	" " " " .....	207 80
1933	" " " " .....	165 75
2040	" " " " .....	162 30
2155	" " " " .....	174 35
2307	" " " " .....	170 95
2425	" " " " .....	143 79
2516	" " " " .....	73 80
2669	" " " " .....	31 80
2720	" " " " .....	30 25
2760	" " " " .....	33 75
	Total .....	\$1,857 01
115	J. W. Judy, per diem and expenses.....	\$100 00
487	" " " " .....	48 00
912	" " " " .....	48 00
991	" " " " .....	20 50
1166	" " " " .....	55 50
1256	" " " " .....	22 75
1492	" " " " .....	55 15
1678	" " " " .....	146 90
1836	" " " " .....	171 30
1971	" " " " .....	169 80
2057	" " " " .....	153 70
2157	" " " " .....	162 40
2314	" " " " .....	154 40
2420	" " " " .....	147 65

## General Fund—Continued.

Voucher.	To Whom Paid.	Amount.
2512½	J. W. Judy, per diem and expenses.....	\$46 70
2697	“ “ “ “ .....	12 85
2770	“ “ “ “ .....	30 00
	Total .....	\$1,545 60
2	S. W. Johns, per diem and expenses.....	\$34 75
59	“ “ “ “ .....	25 25
118	“ “ “ “ .....	65 17
224	“ “ “ “ .....	52 95
327	“ “ “ “ .....	47 70
574	“ “ “ “ .....	43 50
813	“ “ “ “ .....	52 00
913	“ “ “ “ .....	23 00
973	“ “ “ “ .....	23 85
1148	“ “ “ “ .....	59 10
1295	“ “ “ “ .....	82 50
1486	“ “ “ “ .....	106 75
1671	“ “ “ “ .....	160 90
1827	“ “ “ “ .....	142 80
1932	“ “ “ “ .....	176 00
2039	“ “ “ “ .....	166 00
2144	“ “ “ “ .....	146 50
2305	“ “ “ “ .....	158 75
2422	“ “ “ “ .....	149 25
2507	“ “ “ “ .....	68 60
2667	“ “ “ “ .....	19 50
2717	“ “ “ “ .....	11 00
2731	“ “ “ “ .....	3 50
2767	“ “ “ “ .....	21 25
	Total .....	\$1,840 57
74	J. Irving Pearce, per diem and expenses.....	\$71 00
132	“ “ “ “ .....	13 80
135	“ “ “ “ .....	65 00
1165	“ “ “ “ .....	220 00
1294	“ “ “ “ .....	67 35
1491	“ “ “ “ .....	52 75
1732	“ “ “ “ .....	129 40
1835	“ “ “ “ .....	126 95
1958	“ “ “ “ .....	127 65
2089	“ “ “ “ .....	134 20
2195	“ “ “ “ .....	132 10
2347	“ “ “ “ .....	140 00
2354½	“ “ “ “ .....	464 35
2472	“ “ “ “ .....	129 80
2512	“ “ “ “ .....	40 60

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
2677	J. Irving Pearce, per diem and expenses .....	\$10 15
2766	“ “ “ .....	69 00
2785	“ “ “ .....	5 00
Total .....		\$1,999 10
6	B. Pullen, per diem and expenses .....	\$44 50
57	“ “ “ .....	41 50
130	“ “ “ .....	28 75
265	“ “ “ .....	44 25
370	“ “ “ .....	40 25
453	“ “ “ .....	55 70
571	“ “ “ .....	26 50
654	“ “ “ .....	29 25
815	“ “ “ .....	120 00
977	“ “ “ .....	60 35
1131	“ “ “ .....	61 50
1261	“ “ “ .....	26 65
1487	“ “ “ .....	41 85
1673	“ “ “ .....	173 94
1839	“ “ “ .....	178 32
1931	“ “ “ .....	171 80
2042	“ “ “ .....	178 15
2153	“ “ “ .....	179 60
2310	“ “ “ .....	190 35
2421	“ “ “ .....	166 50
2518	“ “ “ .....	51 72
2672	“ “ “ .....	56 05
2723	“ “ “ .....	28 20
2735	“ “ “ .....	21 25
2749	“ “ “ .....	11 50
2758	“ “ “ .....	10 00
Total .....		\$2,038 43
62	E. C. Pace, per diem and expenses .....	\$82 25
123	“ “ “ .....	67 00
227	“ “ “ .....	36 50
326	“ “ “ .....	27 75
447	“ “ “ .....	14 25
579	“ “ “ .....	17 50
806	“ “ “ .....	94 94
907	“ “ “ .....	26 00
976	“ “ “ .....	55 95
1158	“ “ “ .....	86 77
1255	“ “ “ .....	45 26
1532	“ “ “ .....	42 43
1660	“ “ “ .....	142 61
1838	“ “ “ .....	143 54
1934	“ “ “ .....	138 55
2041	“ “ “ .....	150 20

## General Fund—Continued.

Voucher.	To Whom Paid.	Amount.
2151	E. C. Pace, per diem and expenses.....	\$147 70
2312	“ “ “ .....	225 75
2426	“ “ “ .....	152 04
2509	“ “ “ .....	67 35
2688	“ “ “ .....	28 10
2714	“ “ “ .....	21 00
2747	“ “ “ .....	29 50
2762	“ “ “ .....	10 00
2781	“ “ “ .....	10 00
Total .....		\$1,862 84
18	John P. Reynolds, salary and expenses.....	\$583 33
33	“ “ “ .....	583 33
51	“ “ “ .....	583 34
78	“ “ “ .....	583 33
104	“ “ “ .....	583 33
154	“ “ “ .....	583 34
198	“ “ “ .....	583 34
254	“ “ “ .....	583 33
298	“ “ “ .....	583 34
360	“ “ “ .....	583 33
416	“ “ “ .....	583 33
483	“ “ “ .....	583 34
550	“ “ “ .....	583 33
638	“ “ “ .....	583 33
700	“ “ “ .....	588 34
784	“ “ “ .....	583 33
858	“ “ “ .....	583 33
955	“ “ “ .....	583 34
1030	“ “ “ .....	583 33
1121	“ “ “ .....	583 33
1228	“ “ “ .....	583 34
1382	“ “ “ .....	583 33
1677	“ “ “ .....	137 05
1840	“ “ “ .....	130 70
1956	“ “ “ .....	125 00
2060	“ “ “ .....	125 00
2150	“ “ “ .....	132 80
2311	“ “ “ .....	125 00
2489	“ “ “ .....	125 00
Total .....		\$13,733 89
1151	John P. Reynolds, employes pay-rolls.....	\$59 85
1193	“ “ “ .....	11 55
1194	“ “ “ .....	81 50
1222	“ “ “ .....	93 35
1227	“ “ “ .....	97 35

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
1285	John P. Reynolds, employes pay-rolls .....	\$85 00
1298	“ “ “ .....	92 90
1349	“ “ “ .....	98 90
	<b>Total</b> .....	<b>\$620 40</b>
3	W. D. Stryker, per diem and expenses .....	\$30 00
63	“ “ “ .....	21 00
111	“ “ “ .....	30 00
144	“ “ “ .....	47 18
218	“ “ “ .....	10 00
259	“ “ “ .....	22 75
369	“ “ “ .....	20 00
452	“ “ “ .....	12 25
489	“ “ “ .....	16 00
614	“ “ “ .....	20 00
809	“ “ “ .....	70 00
981	“ “ “ .....	41 75
1145	“ “ “ .....	65 00
1262	“ “ “ .....	124 95
1499	“ “ “ .....	132 45
1698	“ “ “ .....	127 60
1829	“ “ “ .....	146 30
1935	“ “ “ .....	137 25
2058	“ “ “ .....	137 15
2142	“ “ “ .....	133 25
2313	“ “ “ .....	135 70
2424	“ “ “ .....	133 75
2505	“ “ “ .....	115 90
2673	“ “ “ .....	88 75
2698	“ “ “ .....	24 00
2719	“ “ “ .....	22 25
2730	“ “ “ .....	5 25
2760	“ “ “ .....	23 50
	<b>Total</b> .....	<b>\$1,893 98</b>
122	Wm. Stewart, per diem and expenses .....	\$50 00
206	“ “ “ .....	50 00
455	“ “ “ .....	20 00
811	“ “ “ .....	80 00
982	“ “ “ .....	30 00
1132	“ “ “ .....	72 00
1263	“ “ “ .....	74 35
1490	“ “ “ .....	111 70
1672	“ “ “ .....	158 35
1830	“ “ “ .....	155 35
1950	“ “ “ .....	150 90
2427	“ “ “ .....	135 10
2050	“ “ “ .....	142 10
2510	“ “ “ .....	116 55

## General Fund—Continued.

Voucher.	To Whom Paid.	Amount.
2156	Wm. Stewart, per diem and expenses.....	\$137 40
2671	" " " " .....	16 20
2331	" " " " .....	142 60
2708	" " " " .....	13 75
2746	" " " " .....	23 20
2751	" " " " .....	10 00
2778	" " " " .....	13 50
Total.....		\$1,703 05
75	D. W. Vittum, per diem and expenses.....	\$47 00
810	" " " " .....	134 75
1001	" " " " .....	68 25
1187	" " " " .....	31 50
1328	" " " " .....	26 00
1700	" " " " .....	136 95
1909	" " " " .....	145 60
1952	" " " " .....	141 28
2062	" " " " .....	147 20
2213	" " " " .....	142 20
2348	" " " " .....	146 30
2469	" " " " .....	154 10
2521	" " " " .....	61 00
2675	" " " " .....	21 50
2722	" " " " .....	16 50
2759	" " " " .....	22 00
Total.....		\$1,442 13
8	John Virgin, per diem and expenses.....	\$35 75
65	" " " " .....	15 00
129	" " " " .....	17 55
178	" " " " .....	29 35
306	" " " " .....	27 35
494	" " " " .....	48 00
818	" " " " .....	25 00
985	" " " " .....	95 00
1223	" " " " .....	97 85
1299	" " " " .....	32 00
1652	" " " " .....	160 00
1685	" " " " .....	208 00
1837	" " " " .....	211 00
1959	" " " " .....	205 30
2051	" " " " .....	201 30
2149	" " " " .....	206 80
2327	" " " " .....	212 80
2468	" " " " .....	202 80
2517	" " " " .....	64 65
2668	" " " " .....	10 60
2687	" " " " .....	20 96

## General Fund—Continued.

Voucher.	To Whom Paid.	Amount.
2707	John Virgin, per diem and expenses.....	\$16 00
2745	“ “ “ .....	15 75
2763	“ “ “ .....	10 00
Total.....		\$2,168 81
9	J. M. Washburn, per diem and expenses .....	\$50 20
72	“ “ “ .....	21 85
116	“ “ “ .....	54 20
170	“ “ “ .....	27 05
215	“ “ “ .....	13 00
329	“ “ “ .....	29 60
390	“ “ “ .....	28 10
529	“ “ “ .....	34 10
704	“ “ “ .....	36 90
808	“ “ “ .....	94 30
1002	“ “ “ .....	50 00
1186	“ “ “ .....	65 70
1301	“ “ “ .....	31 75
1500	“ “ “ .....	120 00
1674	“ “ “ .....	212 25
1832	“ “ “ .....	206 40
1951	“ “ “ .....	201 85
2061	“ “ “ .....	211 95
2152	“ “ “ .....	204 05
2304	“ “ “ .....	172 00
2463	“ “ “ .....	143 90
2645	“ “ “ .....	100 30
2685	“ “ “ .....	99 50
2727	“ “ “ .....	37 20
2757	“ “ “ .....	98 02
Total.....		\$2,344 17
12	B. F. Wyman, per diem and expenses .....	\$47 75
55	“ “ “ .....	21 50
120	“ “ “ .....	42 50
217	“ “ “ .....	30 00
303	“ “ “ .....	35 00
466	“ “ “ .....	26 50
583	“ “ “ .....	15 00
748	“ “ “ .....	15 00
814	“ “ “ .....	45 80
916	“ “ “ .....	15 75
983	“ “ “ .....	30 75
1157	“ “ “ .....	36 85
1495	“ “ “ .....	173 80
1670	“ “ “ .....	212 16
1842	“ “ “ .....	211 28
1955	“ “ “ .....	207 70
2054	“ “ “ .....	207 55

## General Fund—Continued.

Voucher.	To Whom paid.	Amount.
2143	B. F. Wyman, per diem and expenses.....	\$207 95
2303	“ “ “ .....	162 40
2315	“ “ “ .....	5 80
2419	“ “ “ .....	136 30
2515	“ “ “ .....	87 25
2765	“ “ “ .....	33 19
2662	“ “ “ .....	31 44
2716	“ “ “ .....	73 43
	<b>Total.....</b>	<b>\$2,112 65</b>
1397	Employés pay-rolls.....	\$110 00
1417	“ “ .....	115 50
1501	“ “ .....	141 25
1540	“ “ .....	1,670 84
1541	“ “ .....	25 00
1661	“ “ .....	1,913 82
1751	“ “ .....	1,899 99
1821	“ “ .....	2,330 17
1882	“ “ .....	2,407 66
1953	“ “ .....	2,463 32
2003	“ “ .....	2,530 33
2052	“ “ .....	2,548 52
2116	“ “ .....	2,396 32
2136	“ “ .....	2,450 82
2206	“ “ .....	2,359 98
2302	“ “ .....	2,494 34
2369	“ “ .....	900 60
2416	“ “ .....	856 09
2498	“ “ .....	401 65
2504	“ “ .....	348 00
	<b>Total.....</b>	<b>\$30,364 20</b>
2492	Adams Express Co.....	\$29 40
2370	American Express Co.....	169 05
2462	“ “ .....	74 25
2479	“ “ .....	57 00
2682	“ “ .....	22 55
2395	Associated “ .....	106 10
2457	“ “ .....	16 35
2496	“ “ .....	48 05
2501	“ “ .....	12 50
2733	“ “ .....	1 95
1719	Brinks' C. C. “ .....	7 00
1744	“ “ .....	59 04
1917	“ “ .....	5 00
	<b>Total.....</b>	<b>\$608 24</b>

## General Fund—Continued.

Voucher.	To Whom Paid.	Amount.
13	P. C. Brooks, rent.....	\$100 00
32	" ".....	100 00
49	" ".....	100 00
91	" ".....	100 00
107	" ".....	100 00
126	" ".....	141 65
149	" ".....	128 33
199	" ".....	128 34
242	" ".....	128 33
294	" ".....	128 34
345	" ".....	128 33
409	" ".....	128 33
475	" ".....	128 34
542	" ".....	128 33
639	" ".....	128 33
687	" ".....	128 34
781	" ".....	128 33
871	" ".....	128 33
950	" ".....	128 34
1027	" ".....	128 33
1120	" ".....	128 33
1234	" ".....	128 34
	Total.....	\$2,694 99
20	Chicago Carpet Co.....	\$219 65
40	" ".....	46 60
100	" ".....	1 75
1894	" ".....	770 04
2192	" ".....	10 00
	Total.....	\$1,048 04
157	Chicago Gas Light and Coke Co.....	\$2 10
177	" " ".....	1 25
898	" " ".....	2 75
987	" " ".....	4 65
1048	" " ".....	4 50
1133	" " ".....	3 12
1283	" " ".....	2 64
1481	" " ".....	1 44
	Total.....	\$22 45
158	Chicago Telephone Co.....	\$25 77
267	" ".....	31 25
467	" ".....	31 25
679	" ".....	31 25
928	" ".....	31 25
2177	" ".....	92 50
	Total.....	\$243 27

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
1802	M. A. Ersham & Co., badges .....	\$55 00
1867	"                    "                    " .....	3 00
2401	"                    "                    " .....	4 50
	Total.....	\$62 50
1851	Marshall Field & Co. ....	\$41 00
1978	"                    "                    " .....	23 40
2169	"                    "                    " .....	3 42
2414	"                    "                    " .....	68 00
	Total.....	\$135 82
1853	Pearson Lumber Co. ....	\$78 23
2415	"                    "                    " .....	67 79
2458	"                    "                    " .....	60 21
	Total.....	\$206 23
101	Garden City Towel Co. ....	\$2 80
180	"                    "                    " .....	3 00
330	"                    "                    " .....	3 00
610	"                    "                    " .....	3 25
832	"                    "                    " .....	5 00
1214	"                    "                    " .....	3 75
2394	"                    "                    " .....	2 50
	Total.....	\$23 30
38	Trevor Spring Water Co. ....	\$3 33
138	"                    "                    " .....	12 83
268	"                    "                    " .....	12 66
429	"                    "                    " .....	13 33
656	"                    "                    " .....	13 16
899	"                    "                    " .....	13 16
1150	"                    "                    " .....	12 83
1735	"                    "                    " .....	6 00
	Total.....	\$87 30
897	C. P. Van Inwegen, coal. ....	\$22 50
1155	"                    "                    " .....	38 25
1204	"                    "                    " .....	22 50
1322	"                    "                    " .....	135 00
1690	"                    "                    " .....	123 75
1929	"                    "                    " .....	90 00
2163	"                    "                    " .....	23 00
2404	"                    "                    " .....	92 00
2456	"                    "                    " .....	67 50
2525	"                    "                    " .....	30 00
	Total.....	\$644 50

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
1555	Wellington Catering Co. ....	\$975 00
1820	" " .....	800 00
2002	" " .....	483 74
2034	" " .....	400 00
2120	" " .....	1,835 00
2212	" " .....	400 00
2398	" " .....	332 25
Total .....		\$5,225 99
31	Daisy Chaffee, employé .....	\$83 33
52	" " .....	100 00
76	" " .....	100 00
106	" " .....	100 00
152	" " .....	100 00
196	" " .....	100 00
256	" " .....	100 00
300	" " .....	100 00
362	" " .....	100 00
412	" " .....	100 00
485	" " .....	100 00
552	" " .....	100 00
Total .....		\$1,183 33
1654	Emma Covington, employé .....	\$35 00
1862	" " .....	50 00
2000	" " .....	50 00
2073	" " .....	50 00
2165	" " .....	50 00
2319	" " .....	50 00
Total .....		\$285 00
663	J. E. Hamlin, employé .....	\$50 00
693	" " .....	25 00
785	" " .....	50 00
903	" " .....	60 00
945	" " .....	60 00
1039	" " .....	60 00
1123	" " .....	60 00
1231	" " .....	60 00
1384	" " .....	60 00
Total .....		\$485 00
50	N. B. Reed, employé .....	\$4 00
906	" " .....	33 33
946	" " .....	66 67
1041	" " .....	100 00
1122	" " .....	100 00

## General Fund—Continued.

Voucher.	To Whom Paid.	Amount.
1230	N. B. Reed, employé.....	\$100 00
1380	“ “ .....	100 00
2490	“ “ .....	33 00
2657	“ “ .....	100 00
2661	“ “ .....	101 35
2674	“ “ .....	21 00
2743	“ “ .....	62 25
Total.....		\$821 60
108	I. Soderstrom, employé.....	\$40 00
148	“ “ .....	40 00
194	“ “ .....	40 00
243	“ “ .....	40 00
295	“ “ .....	40 00
344	“ “ .....	40 00
Total.....		\$240 00
421	Oscar Thearin, employé.....	\$40 00
472	“ “ .....	40 00
553	“ “ .....	40 00
660	“ “ .....	40 00
689	“ “ .....	40 00
786	“ “ .....	40 00
872	“ “ .....	40 00
949	“ “ .....	40 00
1040	“ “ .....	40 00
1119	“ “ .....	40 00
1232	“ “ .....	40 00
1383	“ “ .....	40 00
Total.....		\$480 00
2189	Herald, Chicago, advertising.....	\$95 00
2461	“ “ “ .....	13 00
2523	“ “ “ .....	12 00
2190	Inter Ocean, “ .....	55 00
2402	“ “ “ .....	1 05
2609	News, Springfield, “ .....	6 30
2646	“ Chicago, “ .....	70 20
2301	Record, “ .....	43 75
2194	Tribune, “ .....	59 50
2403	“ “ “ .....	7 80
2524	“ “ “ .....	8 80
2681	“ “ “ .....	21 45
2249	Times, “ .....	87 50
2642	“ “ “ .....	15 00
Total.....		\$496 35

## General Fund—Continued.

Voucher.	To Whom Paid.	Amount.
2129	C., C., C. & St. L., railroad transportation.....	\$87 73
2691	Chi. & N., W., .....	219 99
2124	I. C. R. R., .....	3,639 12
2130	R. I. & Peo., .....	28 00
2199	St. L., A. & T. H., .....	62 27
2128	T. P. & W., .....	1 30
2139	" .....	87 40
2198	T. H. & I., .....	90 19
Total.....		\$4,216 10
1937	F. G. Cobb, room rent .....	\$45 35
2048	" .....	40 00
2175	" .....	40 00
2345	" .....	44 00
1918	S. H. Dempsey, .....	40 00
2049	" .....	40 00
2158	" .....	40 00
1448	J. S. Mahan, .....	40 00
1636	" .....	50 00
1753	" .....	30 00
1804	" .....	50 00
1805	" .....	40 00
1936	" .....	50 00
1938	" .....	40 00
2044	" .....	40 00
2047	" .....	50 00
2133	" .....	50 00
2135	" .....	40 00
2288	" .....	40 00
2322	" .....	50 00
2045	N. B. Reed, .....	76 00
2141	" .....	76 00
2275	" .....	50 00
2279	" .....	32 00
2337	" .....	42 00
2340	" .....	18 00
2365	" .....	20 00
2372	" .....	16 00
1637	A. Robinson, .....	50 00
1748	" .....	45 00
1902	" .....	30 00
1939	" .....	50 00
2046	" .....	50 00
2145	" .....	25 00
2644	" .....	75 00
Total.....		\$1,514 35

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
1687	Hibbard, Spencer & Co., hardware, etc.....	\$199 52
1854	“ “ .....	39 78
1968	“ “ .....	62 23
2068	“ “ .....	5 25
2167	“ “ .....	26 89
2318	“ “ .....	52 75
2494	“ “ .....	2 77
1884	C. H. Rice, “ .....	53 02
2176	“ “ .....	19 30
2285	“ “ .....	1 20
2460	“ “ .....	18 70
1625	Felix & Marston, “ .....	26 39
1688	“ “ .....	9 34
1858	“ “ .....	18 78
2069	“ “ .....	18 55
2162	“ “ .....	23 10
Total.....		\$577 57
22	John Morris Co., printing and stationery.....	\$37 80
1218	“ “ .....	13 60
1775	“ “ .....	95 40
1796	“ “ .....	503 99
2526	“ “ .....	10 80
2641	“ “ .....	35 91
2689	“ “ .....	5 60
Total.....		\$703 10
2338	E. E. McCoy, agricultural exhibit.....	\$26 55
2367	“ “ .....	16 35
2373	“ “ .....	26 65
2407	“ “ .....	10 95
2429	“ “ .....	10 49
2471	“ “ .....	6 30
2283	J. M. Richart, “ .....	244 45
2329	“ “ .....	217 00
2333	“ “ .....	136 50
2362	“ “ .....	63 35
2366	“ “ .....	248 90
2408	“ “ .....	6 10
2208	W. A. Young, “ .....	115 25
2276	“ “ .....	208 00
2328	“ “ .....	114 60
2332	“ “ .....	35 10
2335	“ “ .....	119 45
2364	“ “ .....	104 15
2374	“ “ .....	133 40
2409	“ “ .....	116 65
2430	“ “ .....	78 40
2470	“ “ .....	93 80

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
2282	D. O. Hoyt, agricultural exhibit.....	\$44 00
2361	A. E. DuBois, ".....	31 00
2334	A. G. Springer, ".....	30 20
2371	" ".....	11 60
	Total.....	\$2,239 19
1362	A. Orendorff.....	\$60 50
1533	".....	94 00
1623	".....	37 70
1864	".....	47 00
1916	".....	25 00
2480	".....	12 00
	Total.....	\$276 20
1738	J. M. Page.....	\$350 00
1739	".....	53 05
1850	".....	300 00
1883	".....	86 90
1997	".....	314 75
2072	".....	328 00
2164	".....	318 50
2320	".....	326 14
	Total.....	\$2,077 34
782	Sommer & Pierik.....	\$230 00
2222	".....	10 00
2392	".....	40 00
2643	".....	40 00
	Total.....	\$320 00
680	M. C. Ames.....	\$1 60
830	".....	1 60
1154	".....	1 60
	Total.....	\$4 80
27	Sherman House.....	\$312 35
117	".....	370 25
161	".....	331 55
343	".....	263 40
499	".....	254 40
578	".....	259 85
752	".....	263 25
834	".....	746 40
835	" carriages.....	200 00
1000	".....	618 50
1167	".....	500 65

*General Fund—Continued.*

Voucher.	To Whom Paid.	Amount.
1304	Sherman House.....	\$402 25
1527	".....	645 25
1737	".....	759 00
1860	".....	421 75
1963	".....	438 50
2082	".....	423 75
2159	".....	443 25
2343	".....	538 50
2477	".....	645 75
2522	".....	513 50
2663	".....	173 00
2734	".....	29 00
2756	".....	14 25
	Total.....	\$9,525 10
1890	World's Columbian Exposition.....	\$17 00
1992	".....	59 50
2125	".....	747 00
2186	".....	38 00
2221	".....	31 50
2301	".....	335 04
2400	".....	32 01
2405	".....	125 58
2684	".....	6 50
	Total.....	\$1,392 13
23	Wyckoff, Seamans & Benedict.....	\$95 00
35	".....	45 00
1576	".....	31 50
	Total.....	\$171 50
2203	National Fire Works, fire works.....	\$100 00
2038	Paine & Sons, ".....	1,200 00
	Total.....	\$1,300 00
2036	Pullman Band, music.....	\$306 00
2211	".....	306 00
1556	A. F. Weldon, ".....	213 00
	Total.....	\$825 00

*General Fund—Concluded.***Recapitulation.**

Miscellaneous .....	\$15,625 30
Members of Commission, per diem and salary .....	53,993 34
Pay-rolls employés .....	33,139 26
Fireworks .....	1,300 00
Music .....	825 00
Express charges .....	608 24
Rent, offices .....	2,694 99
Carpets .....	1,048 04
Coke .....	22 45
Telephone service .....	243 27
Badges .....	62 50
Sundries .....	135 82
Lumber .....	206 23
Towels .....	23 30
Mineral water .....	87 30
Coal .....	644 50
Wellington Catering Co. ....	5,225 99
Employés in office .....	3,494 93
Advertising .....	496 35
Transportation of militia .....	4,216 10
Room rent, Commissioners .....	1,514 35
Hardware .....	577 57
Printing and stationery .....	703 10
Agricultural Exhibit, National Building .....	2,239 19
A. Orendorff, account Memorial Exhibit .....	276 20
Illinois Press Association—J. M. Page .....	2,077 34
Medals .....	320 00
Newspapers .....	4 80
Sherman House, hotel bills .....	9,368 35
Carriage hire Dedication Day .....	200 00
World's Columbian Exposition .....	1,392 13
Typewriter supplies .....	171 50
W. C. Garrard, sundries .....	126 82
<b>Total .....</b>	<b>\$143,064 26</b>

## REPORT OF CONSTRUCTION COMMITTEE.

THE Committee on Construction, have examined and compared that part of the report of the Committee on Finance and the vouchers which relate to the Committee on Construction with the final report of the Committee on Construction, and fail to find that there is any discrepancy between the two reports when the additional expenditures made by order of the Board are added to the expenditures reported by this Committee.

JOHN VIRGIN,  
J. IRVING PEARCE,  
J. W. JUDY,  
D. W. VITTUM,  
J. M. WASHBURN,  
B. PULLEN.

### CONSTRUCTION COMMITTEE DISTRIBUTION.

Voucher.	To Whom Paid.	Amount.
165	Harlev & Son.....	\$1,500 00
169	" .....	2,000 00
179	" .....	3,500 00
204	" .....	8,000 00
239	" .....	18,000 00
264	" .....	14,000 00
279	" .....	5,000 00
309	" .....	10,000 00
364	" .....	10,000 00
365	" .....	451 40
392	" .....	4,653 75
393	" .....	299 48
398	" .....	5,000 00
399	" .....	380 00
446	" .....	12,000 00
457	" .....	8,500 00
498	" .....	4,300 00
531	" .....	5,000 00
555	" .....	15,500 00

## Construction Committee Distribution—Continued.

Voucher.	To Whom Paid.	Amount.
612	Harley & Son.....	\$19,700 00
645	“.....	10,030 00
646	“.....	1,240 00
684	“.....	5,500 00
685	“.....	2,400 00
787	“.....	4,000 00
822	“.....	4,505 44
974	“.....	3,000 00
975	“.....	3,500 00
1134	“.....	57 10
1135	“.....	290 11
1136	“.....	15 90
1137	“.....	600 00
1138	“.....	300 84
1139	“.....	278 03
1140	“.....	1,000 00
1141	“.....	761 15
1142	“.....	184 72
1387	“.....	91 04
1388	“.....	10,000 00
1480	“.....	250 16
1238	W. E. Palmer, account of Harley & Sons....	1,076 00
1239	C. G. Wade, “ “.....	1,762 25
1240	Beck Lumber Co., account of Harley & Sons....	1,924 00
1241	Paige Iron Co., “ “.....	2,511 00
1505	Phillip Steiner, “ “.....	331 01
1544	Geo. F. Kimball, “ “.....	437 79
1546	Turnbull & Cullerton, “ “.....	408 42
1783	Smith & Levering, “ “.....	23 00
1784	Ill. Roofing & Supply Co., “ “.....	750 00
	Total .....	\$204,812 50
21	W. W. Boyington.....	\$2,000 00
113	“.....	4,000 00
495	“.....	3,000 00
1113	“.....	2,000 00
2647	“.....	500 00
	Total .....	\$11,500 00
117	Sherman House.....	\$13 00
161	“.....	71 75
343	“.....	68 25
499	“.....	45 75
578	“.....	50 00
752	“.....	48 50
1000	“.....	111 50
1167	“.....	21 00
	Total.....	\$429 75

*Construction Committee Distribution—Continued.*

Voucher.	To Whom Paid.	Amount.
119	D. H. Paddock .....	\$70 50
225	" .....	64 00
902	" .....	200 00
1102	" .....	223 50
	Total .....	\$558 00
5	J. H. Bradley .....	\$20 00
280	" .....	20 00
817	" .....	49 80
911	" .....	33 75
1112	" .....	33 08
	Total .....	\$156 63
74	J. Irving Pearce .....	\$20 00
1165	" .....	170 00
1294	" .....	10 00
1491	" .....	10 00
2085	" .....	36 60
	Total .....	\$246 60
8	John Virgin .....	\$20 00
65	" .....	5 00
129	" .....	25 00
178	" .....	45 00
306	" .....	105 00
494	" .....	141 70
744	" .....	160 77
818	" .....	82 10
985	" .....	186 45
1098	" .....	167 45
1223	" .....	70 00
1299	" .....	180 85
	Total .....	\$1,189 32
115	J. W. Judy .....	\$5 00
487	" .....	32 00
	Total .....	\$37 00
62	E. C. Pace .....	\$15 00
749	" .....	22 75
907	" .....	29 25
	Total .....	\$67 00

*Construction Committee Distribution—Continued.*

Voucher.	To Whom Paid.	Amount.
130	B. Pullen .....	\$36 20
1131	“ .....	11 00
1261	“ .....	22 80
	Total .....	\$70 00
4	L. Funk .....	\$11 50
71	“ .....	5 00
305	“ .....	44 70
562	“ .....	36 20
986	“ .....	11 75
	Total.....	\$109 15
64	David Gore .....	\$15 00
910	“ .....	29 50
	Total.....	\$44 50
116	J. M. Washburn.....	\$39 65
810	D. W. Vittum.....	33 00
MISCELLANEOUS VOUCHERS.		
90	State Journal.....	\$66 50
97	Daily News.....	57 76
98	Chicago Times.....	57 00
99	Tribune Co.....	153 00
134	Chicago Herald .....	100 00
139	V. F. Lawson.....	61 88
140	State Journal .....	55 00
159	T. W. S. Kidd.....	20 00
331	World's Columbian Exposition.....	47 84
458	Orr & Lockett.....	14 00
492	Inter-State Industrial Exposition .....	401 67
554	World's Columbian Exposition .....	594 00
575	J. C. Ure .....	321 40
747	“ .....	215 12
755	Roberts Bros.....	693 31
788	Jno. C. Ure .....	500 00
831	Roberts Bros.....	24 00
836	Orr & Lockett .....	3 37
874	J. C. Ure.....	660 00
924	Fire Extinguisher Manufacturing Co. ....	375 00
944	J. C. Ure .....	166 85
969	Fuller & Warren Co.....	71 95
996	D. H. Burnham.....	567 28
1010	Paul Lietz .....	50 00
1011	“ .....	90 00
1012	W. C. Garrard.....	25
1016	Horton & Pfeiffer.....	12 50

*Construction Committee Distribution—Continued.*

Voucher.	To Whom Paid.	Amount.
1018	World's Columbian Exposition.....	\$286 60
1019	“ “ .....	605 00
1045	Delaware & Hudson Canal Co.....	54 35
1049	Horton, Pfeiffer & Lee .....	20 78
1050	C. N. Dennis .....	25 00
1070	Horton, English & Co. ....	1,300 00
1072	C. P. Van Inwegen .....	22 50
1083	N. Y. Ins. Wire Co.....	50 00
1103	Paul Lietz .....	110 00
1106	Thos. Collins .....	62 60
1118	Paul Lietz .....	240 71
1143	Am. Desk and Seating Co.....	43 00
1181	C. H. Rice .....	37 60
1183	Jno. C. Ure .....	14 50
1195	Detroit Heating & Co.....	1,010 00
1219	Delaware & Hudson Canal Co. ....	25 00
1220	Jno. C. Ure.....	83 37
1233	Paul Lietz .....	25 07
1235	Horton, Pfeiffer & Lee.....	405 71
1236	“ .....	138 68
1242	Kelley Bros.....	2,300 00
1251	Jno. C. Ure .....	17 50
1326	“ .....	106 50
1359	Chicago Carpet Co.....	2,400 00
1370	W. H. Hackett ..	359 00
1373	Horton, Pfeiffer & Lee .....	498 64
1398	Kelley Bros.....	2,329 20
1464	Parkhurst & Wilkinson .....	37 20
1502	Grand Rapids S. F. Co.....	1,093 11
1528	Am. Desk and Seating Co.....	255 45
1530	J. H. Rice Co. ....	55 02
1534	Bullard & Gormley .....	4 65
1539	J. B. Mora .....	500 00
1548	F. R. Bagley & Co.....	4 80
1551	J. S. Ford, Johnson & Co.....	138 00
1552	L. Funk ..	2 25
1553	Jno. C. Ure .....	296 21
1558	Channon Canvas R. Co. ....	536 48
1559	W. H. Bartels.....	23 20
1560	O. H. P. Connell .....	25 00
1561	E. B. Preston & Co.....	1,276 00
1562	H. Channon Co.....	99 70
1563	B. Steiner .....	305 98
1564	Horton, Pfeiffer & Lee .....	773 84
1565	“ .....	230 84
1566	Interior Building Co.....	1,783 78
1578	Tobey Furn. Co.....	27 50
1579	Tyler & Hippach .....	13 00
1580	Higgins, Todd & Co.....	54 00
1581	C. H. Rice .....	7 50
1626	Chicago Carpet Co .....	1,986 36

*Construction Committee Distribution—Continued.*

Voucher.	To Whom Paid.	Amount.
1630	J. B. Mora.....	\$1,000 00
1631	E. A. Summerfield.....	180 00
1633	Am. Desk and Seating Co.....	86 60
1644	“ “.....	51 50
1645	Horton, Pfeiffer & Lee.....	895 36
1646	World's Columbian Exposition.....	7 99
1647	J. S. Ford, Johnson & Co.....	35 25
1656	Hostrawser & Hamilton.....	122 00
1658	Pearson Lumber Co.....	28 52
1662	Brooks & Clark.....	600 00
1664	W. H. Hackett.....	771 61
1665	H. Diblee Co.....	38 50
1666	Heath & Milligan.....	3 81
1704	Grand Rapids S. F. Co.....	1,102 72
1705	Jno. McLane.....	156 42
1706	W. H. Stubbins Co.....	2,500 00
1707	Sherrard & Co.....	55 00
1745	Horton, Pfeiffer & Lee.....	68 50
1749	Wm. Ficklin Co.....	257 00
1750	A. R. Beck L. Co.....	3,671 99
1752	Jno. C. Ure.....	210 00
1780	Paul Lietz.....	100 00
1781	Pomeroy & Co.....	97 40
1782	S. A. Maxwell & Co.....	246 57
1797	A. H. Revell & Co.....	145 00
1798	L. G. Hansen.....	32 00
1799	Am. Desk & Seating Co.....	29 00
1801	Hildreth Furn. Co.....	170 00
1803	J. S. Ford, Johnson & Co.....	31 00
1822	P. Steiner.....	479 91
1885	F. J. Barnes.....	144 00
1894	Chicago Carpet Co.....	282 63
1895	E. C. Cook & Bro.....	114 00
1910	Turnbull & Cullerton.....	985 00
1966	Shelden & Hall.....	34 95
1967	W. H. Stubbins.....	2,736 10
1996	L. Wurzburg.....	75 00
2001	Phillip Steiner.....	400 00
2012	Horton, Pfeiffer & Lee.....	114 42
2013	Devos & Reynolds Co.....	125 27
2117	J. C. Ure.....	150 00
2180	Turnbull & Cullerton.....	215 25
2184	Horton, Pfeiffer & Lee.....	2,919 74
2185	Paul Lietz.....	300 00
2193	Chicago Carpet Co.....	229 13
2217	Horton, Pfeiffer & Lee.....	175 44
2220	Turnbull & Cullerton.....	103 75

*Construction Committee Distribution—Concluded.*

Voucher.	To Whom Paid.	Amount.
2351	Illinois Roofing Co.....	\$296 71
2352	Turnbull & Cullerton .....	340 00
2354	World's Columbian Exposition.....	8,184 09
	Total.....	\$58,579 39

**Recapitulation.**

Wm. Harlev & Son.....	\$204,812 59
W. W. Boyington & Co.....	11,500 00
Sherman House.....	429 75
D. H. Paddock.....	558 00
J. Harley Bradley.....	156 63
J. Irving Pearce.....	246 60
John Virgin.....	1,189 32
J. W. Judy.....	37 00
E. C. Pace.....	67 00
B. Pullen.....	70 00
LaFayette Funk.....	109 15
David Gore.....	44 50
J. M. Washburn.....	39 65
D. W. Vittum.....	33 00
Miscellaneous.....	58,579 39
Total.....	\$277,872 58

# **COMMITTEE ON STATE INSTITUTIONS.**

Voucher.	To Whom Paid.	Amount.
<b>MISCELLANEOUS.</b>		
328	St. Nicholas Hotel.....	\$27 00
972	J. W. Taylor.....	75 00
1514	Geo. C. Mages.....	29 75
1683	P. F. Gillett.....	75 00
1845	S. F. Wood.....	51 61
1975	R. F. Lancaster.....	60 00
1981	Miss Alma Gillett.....	72 60
2030	W. F. Short.....	822 60
2081	Mrs. Mate David.....	52 50
2126	".....	35 90
2131	W. F. Short.....	876 49
2134	J. H. Brown.....	34 45
2204	Miss M. A. Collins.....	40 90
2321	W. F. Short.....	162 00
2386	A. M. Miller.....	31 45
Total .....		\$2,447 25
<b>STATE INSTITUTIONS.</b>		
1907	Deaf and Dumb Institution.....	\$112 35
2317	" ".....	56 35
2324	" ".....	21 50
Total .....		\$190 20
1247	Feeble-Minded Institution.....	\$262 35
1979	" ".....	78 00
Total .....		\$340 35
1515	Frank H. Hall, account Institution for the Blind..	\$94 10
1557	" ".....	204 82
1716	" ".....	334 35
1868	" ".....	794 39
Total .....		\$1,427 66
562	L. Funk.....	\$10 00
986	".....	5 00
1552	".....	12 00
Total .....		\$27 00

*Committee on State Institutions—Continued.*

Voucher.	To Whom Paid.	Amount.
3	W. D. Stryker.....	\$10 25
302	" .....	20 00
452	" .....	10 00
489	" .....	10 00
563	" .....	62 85
614	" .....	21 50
919	" .....	20 00
1262	" .....	5 00
	Total .....	\$159 60
11	A. B. Hostetter.....	\$6 50
308	" .....	30 00
463	" .....	11 00
561	" .....	58 55
582	" .....	45 65
653	" .....	31 10
741	" .....	5 40
904	" .....	10 60
905	" .....	39 85
978	" .....	10 00
1092	" .....	27 35
1149	" .....	6 00
1300	" .....	10 35
1493	" .....	30 30
	Total .....	\$322 65
303	B. F. Wyman.....	\$29 85
466	" .....	20 00
583	" .....	38 35
748	" .....	10 00
916	" .....	5 00
1307	" .....	5 00
	Total.....	\$108 20
323	David Gore .....	\$16 50
454	" .....	15 00
	Total .....	\$31 50
329	J. M. Washburn .....	\$66 55
390	" .....	23 10
529	" .....	32 30
615	" .....	48 95
704	" .....	24 50
1088	" .....	31 60
1301	" .....	12 00
1500	" .....	55 05
2727	" .....	25 00
	Total .....	\$319 05

*Committee on State Institutions—Concluded.*

Voucher.	To Whom Paid.	Amount.
487	J. W. Judy .....	\$15 50
912	" .....	42 50
1256	" .....	5 40
	Total .....	\$63 40
161	Sherman House .....	\$7 90
343	" .....	1 00
578	" .....	21 50
752	" .....	40 50
1167	" .....	11 50
1304	" .....	5 50
1527	" .....	31 25
	Total .....	\$119 15
491	Brouse & Martin .....	\$109 90
556	" .....	477 00
557	" .....	98 69
651	" .....	199 50
922	" .....	872 10
1009	" .....	652 25
1084	" .....	35 25
1477	" .....	5 78
1638	" .....	193 25
	Total .....	\$2,643 72

**Recapitulation.**

Miscellaneous .....	\$2,447 25
Institution for Deaf and Dumb .....	190 20
Institution for Feeble-Minded .....	340 35
Frank H. Hall .....	1,427 66
LaFayette Funk .....	27 00
W. D. Stryker .....	159 60
A. B. Hostetter .....	322 65
B. F. Wyman .....	108 20
David Gore .....	31 50
J. M. Washburn .....	319 05
J. W. Judy .....	63 40
Sherman House .....	119 15
Brouse & Martin .....	2,643 72
Total .....	\$8,199 73

# COMMITTEE ON GROUNDS.

Voucher.	To Whom Paid.	Amount.
747	John C. Ure.....	\$34 37
874	".....	170 00
917	".....	100 00
942	".....	50 00
944	".....	74 55
1078	".....	50 00
1183	".....	14 50
1221	".....	100 00
1251	".....	17 50
1348	".....	900 00
1416	".....	400 00
1538	".....	336 00
1553	".....	215 36
1752	".....	107 00
1824	".....	500 00
1945	".....	200 00
2078	".....	74 88
2117	".....	121 63
2342	".....	47 25
2406	".....	46 00
Total.....		\$3,559 04
MISCELLANEOUS.		
923	J. C. Vaughan.....	\$68 60
1045	Delaware & Hudson Canal Co.....	54 40
1050	C. N. Dennis.....	25 00
1106	Thomas Collins, agent.....	62 31
1219	Delaware & Hudson Canal Co.....	25 75
1503	D. O. Loy.....	100 00
1504	David Richards.....	50 00
1622	D. O. Loy.....	196 25
1714	D. A. Arnold.....	197 50
1889	".....	16 00
2070	Chicago Fire Hose Co.....	20 00
2405	World's Columbian Exposition.....	150 00
Total.....		\$965 81
343	Sherman House.....	\$4 00
1304	".....	10 00
Total.....		\$14 00

*Committee on Grounds—Continued.*

Voucher.	To Whom Paid.	Amount.
110	A. B. Hostetter.....	\$10 00
230	".....	22 25
463	".....	12 75
	Total.....	\$45 00
265	B. Pullen.....	\$20 00
370	".....	29 45
571	".....	23 25
908	".....	11 75
1261	".....	42 35
	Total.....	\$126 80
818	John Virgin.....	\$5 00
1552	L. Funk.....	72 00
327	S. W. Johns.....	10 00
570	David Gore.....	10 00
572	W. H. Fulkerson.....	10 00

**Recapitulation.**

John C. Ure.....	\$3,559 04
Miscellaneous.....	965 81
Sherman House.....	14 00
John Virgin.....	5 00
L. Funk.....	72 00
A. B. Hostetter.....	45 00
B. Pullen.....	126 80
S. W. Johns.....	10 00
David Gore.....	10 00
W. H. Fulkerson.....	10 00
Total .....	\$4,817 65

# **PRINTING AND STATIONERY COMMITTEE.**

Voucher.	To Whom Paid.	Amount.
14	H. W. Rokker.....	\$7 00
70	A. J. Herbst & Co.....	6 25
96	".....	2 75
176	".....	2 00
244	".....	2 00
629	".....	2 35
528	T. W. S. Kidd.....	1 40
659	H. W. Rokker.....	3 50
896	L. Selsmere.....	4 00
1169	Pantagraph Co.....	5 10
1252	H. J. Burt.....	64 75
	Total .....	\$101 10
54	S. D. Childs & Co.....	\$22 05
81	".....	6 05
102	".....	9 75
156	".....	1 75
422	".....	17 30
630	".....	3 80
839	".....	3 00
	Total .....	\$63 70
373	Rand, McNally & Co.....	\$35 00
1898	".....	34 50
1903	".....	7 50
2721	".....	29 25
	Total .....	\$106 25
48	Illinois State Journal.....	\$35 00
253	".....	23 00
828	".....	26 00
1104	".....	11 00
2497	".....	9 36
	Total .....	\$104 36
578	Sherman House.....	\$11 50
1527	".....	4 90
	Total .....	\$16 40
1496	Samuel Dysart.....	\$5 00

*Financial Statement—Continued.*

Voucher.	To Whom Paid.	Amount.
22	John Morris Co. ....	\$78 75
103	" .....	281 40
257	" .....	7 20
396	" .....	3 50
568	" .....	55 00
609	" .....	3 85
655	" .....	1 80
754	" .....	18 55
796	" .....	1 80
844	" .....	51 50
870	" .....	10 00
915	" .....	68 10
926	" .....	63 00
967	" .....	23 00
1069	" .....	15 90
1914	" .....	74 35
1993	" .....	1,146 80
2074	" .....	15 00
2115	" .....	79 10
2291	" .....	74 30
2357	" .....	2,761 85
2495	" .....	49 00
2606	" .....	2,938 19
2641	" .....	40 00
2650	" .....	7 66
2690	" .....	176 00
Total .....		\$8,045 60
2750	J. K. Dickirson.....	\$25 00
2757	J. M. Washburn.....	20 00

**Recapitulation.**

Miscellaneous.....	\$101 10
S. D. Childs & Co.....	63 70
Rand, McNally & Co.....	106 25
Illinois State Journal.....	104 36
Sherman House.....	16 40
Samuel Dysart.....	5 00
John Morris Co.....	8,045 60
J. K. Dickirson.....	25 00
J. M. Washburn.....	20 00
Total.....	\$8,487 41

# NATURAL HISTORY COMMITTEE.

Voucher.	To Whom Paid.	Amount.
24	Wm. McAdams.....	\$15 00
80	".....	125 00
94	".....	125 00
142	".....	79 15
151	".....	125 00
172	".....	98 90
201	".....	125 00
240	".....	125 00
283	".....	129 27
297	".....	125 00
316	".....	86 80
347	".....	125 00
411	".....	125 00
460	".....	108 45
473	".....	125 00
525	".....	73 00
534	".....	125 00
627	".....	62 00
1006	".....	15 00
1046	".....	49 40
1339	".....	82 90
1472	".....	120 80
Total .....		\$2,170 67
60	W. F. Nicholson.....	\$250 00
79	".....	83 33
95	".....	83 33
150	".....	83 34
166	".....	18 59
197	".....	83 34
210	".....	12 69
241	".....	83 33
296	".....	83 34
346	".....	83 34
410	".....	83 33
474	".....	83 33
543	".....	83 33
616	".....	83 33
686	".....	64 37
688	".....	83 34
769	".....	83 33
798	".....	7 74
869	".....	83 33
951	".....	83 34
1028	".....	83 33

*Natural History Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
1129	W. F. Nicholson .....	\$83 33
1246	" .....	83 34
1338	" .....	1 12
1402	" .....	83 33
	Total .....	\$1,937 85
131	Josua Lindahl .....	\$111 99
145	" .....	20 00
167	" .....	4 20
208	" .....	30 30
277	" .....	5 22
304	" .....	57 55
431	" .....	54 55
520	" .....	56 47
601	" .....	165 28
683	" .....	35 65
743	" .....	55 12
932	" .....	170 39
998	" .....	110 10
1091	" .....	89 73
1201	" .....	53 90
1303	" .....	18 75
1343	" .....	5 50
2018	" .....	22 00
2019	" .....	59 05
2739	" .....	10 75
	Total .....	\$1,136 50
117	Sherman House .....	\$25 75
161	" .....	43 25
343	" .....	19 00
499	" .....	67 75
1167	" .....	108 25
	Total .....	\$264 00
765	Frank Leverett .....	\$99 31
838	" .....	251 50
931	" .....	248 47
	Total .....	\$599 28
	MISCELLANEOUS.	
266	Schulz & Co. ....	\$30 10
312	DeMuth Bros. ....	29 80
340	State Journal .....	18 75

*Natural History Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
681	H. L. Ide . . . . .	\$10 35
682	J. M. Nickles . . . . .	140 90
790	H. L. Ide . . . . .	9 15
793	David White . . . . .	73 35
828	State Journal . . . . .	5 50
842	F. P. Anderson . . . . .	6 20
844	Jno. Morris Co. . . . .	59 00
862	W. A. Snow . . . . .	50 00
863	Lillie M. Hart . . . . .	35 00
864	C. A. Hart . . . . .	62 50
865	Hugo Kahl . . . . .	40 00
866	J. E. Hallinen . . . . .	50 00
867	C. F. Adams . . . . .	100 00
884	" . . . . .	14 31
885	Paul Lietz . . . . .	50 00
888	Crescent Dist. Co. . . . .	42 03
889	C. Rominger . . . . .	62 00
900	A. R. Whitney . . . . .	77 50
920	W. K. Yeakel . . . . .	37 00
1013	S. F. Denton . . . . .	20 00
1037	W. A. Snow . . . . .	50 00
1038	H. Kahl . . . . .	40 00
1078	J. C. Ure . . . . .	3 50
1079	N. DuBois . . . . .	7 00
1108	J. W. Taylor . . . . .	103 00
1109	" . . . . .	120 00
1115	McGrue & Powell . . . . .	38 50
1146	Illinois State Journal . . . . .	50 00
1152	Orr & Lockett . . . . .	8 35
1185	Jos. Skeavington . . . . .	3 60
1202	Jno. Keay . . . . .	12 00
1243	L. E. Wyman . . . . .	4 35
1250	Mary Sanford . . . . .	6 20
1293	J. C. Conkling . . . . .	31 25
1309	Freeman's Transfer . . . . .	2 91
1311	A. S. Aloe & Co. . . . .	8 50
1312	J. M. Nick es . . . . .	12 15
1314	Jno. Keay . . . . .	56 35
1318	J. M. Clarke . . . . .	30 00
1326	J. C. Ure . . . . .	163 00
1327	State Journal . . . . .	10 00
1337	Jas. Seaman . . . . .	190 35
1340	L. R. Ibbotson . . . . .	1 05
1345	J. W. Taylor . . . . .	72 00
1368	McGrue & Powell . . . . .	106 50
1369	Freeman's Transfer . . . . .	10 00
1509	O. K. Nelson . . . . .	2 50
1510	Jno. Keay . . . . .	36 00
1511	Kahn & Guerin . . . . .	2 20
1529	Devoe & Reynolds Co. . . . .	7 88
1553	J. C. Ure . . . . .	39 00

*Natural History Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
1573	L. B. Ibbotson .....	\$30 00
1574	J. M. Nickles .....	128 95
1577	Kelsey Press Co. ....	23 50
1663	Murphy Varnish Co. ....	183 60
1711	Devoe & Reynolds Co. ....	15 95
1752	J. C. Ure .....	126 50
1877	Jewell Filter Co. ....	5 00
1889	D. A. Arnold .....	28 80
1892	C. D. Henry .....	1 00
1899	N. W. Terra Cotta Co. ....	25 22
1904	J. D. Peters .....	1 00
1972	Thos. Collins, agent .....	24 20
1985	Jno. Keay .....	36 40
2067	A. C. McClurg & Co. ....	40 00
2076	Architectural Department, University of Illinois.	429 48
2078	J. C. Ure .....	10 00
2132	Jewell Filter Co. ....	117 89
2205	" .....	10 75
2292	" .....	10 75
2298	J. C. Ure .....	232 50
2301	World's Columbian Exposition .....	11 71
2350	Cook & Rathbone .....	16 59
2353	O. Guthrie .....	50 00
2499	Paul Lietz .....	140 00
2683	The Gazette .....	50 05
2686	University of Illinois .....	40 87
146	Fred Perry .....	350 00
155	S. D. Peet .....	14 80
221	J. B. & B. G. Worthen .....	8,000 00
1893	W. & L. E. Gurley .....	8 09
	Total .....	\$12,406 18
209	Adams Express Co. ....	\$18 00
523	American Express Co. ....	4 95
768	United States Express Co. ....	6 60
1199	Adams " .....	1 15
1200	United States " .....	25 30
1313	Adams " .....	2 10
1315	Pacific " .....	1 05
1467	United States " .....	2 70
1744	Brinks' Chicago City Express Co. ....	21 50
1891	American Express Co. ....	8 25
	Total .....	\$91 60
490	J. A. Udden .....	\$81 36
665	" .....	180 10
777	" .....	248 60
1390	" .....	150 00
	Total .....	\$660 06

*Natural History Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
1508	Fannie Fisher .....	\$45 75
1747	“ .....	69 05
1876	“ .....	57 20
1940	“ .....	33 05
	Total.....	\$205 05
1789	D. O. Loy .....	\$165 05
1896	“ .....	99 26
	Total .....	\$264 31
1976	W. F. E. Gurley .....	\$38 65
2092	“ .....	93 80
2178	“ .....	94 50
2360	“ .....	122 79
2474	“ .....	77 05
	Total .....	\$426 79
211	H. W. Rokker .....	17 90
1870	“ .....	48 80
	Total.....	\$66 70
144	W. D. Stryker .....	\$5 00
259	“ .....	10 00
302	“ .....	15 00
489	“ .....	10 00
919	“ .....	27 60
981	“ .....	10 00
1067	“ .....	77 35
1146	“ .....	39 70
1592	“ .....	20 20
	Total .....	\$214 85
227	E. C. Pace .....	\$20 00
326	“ .....	34 25
447	“ .....	60 00
579	“ .....	16 00
907	“ .....	11 00
1532	“ .....	42 00
	Total.....	\$183 25

*Natural History Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
234	David Gore.....	\$5 00
323	".....	10 00
454	".....	5 00
910	".....	5 50
1089	".....	19 50
	Total.....	\$45 00
164	A. B. Hostetter.....	\$16 75
220	".....	23 00
226	".....	53 60
260	".....	16 25
308	".....	47 35
367	".....	16 50
582	".....	10 00
978	".....	10 75
1149	".....	9 00
	Total.....	\$203 20
265	B. Pullen.....	\$40 00
453	".....	15 00
977	".....	20 50
	Total.....	\$75 50
305	L. Funk.....	\$6 45
1552	".....	40 00
1962	".....	2 00
	Total.....	\$48 45
909	J. M. Washburn.....	\$53 48
1002	".....	210 99
1186	".....	70
1484	".....	102 67
	Total.....	\$367 84
954	S. Dysart.....	\$34 00
1081	".....	10 75
1496	".....	7 00
	Total.....	\$51 75
982	Wm. Stewart.....	\$10 00
1101	".....	61 00
	Total.....	\$71 00
1182	Jno. P. Reynolds.....	120 25
1531	B. F. Wyman.....	8 03

*Natural History Committee—Concluded.***Recapitulation.**

Wm. McAdams .....	\$2,170 67
W. F. Nicholson .....	1,937 85
Josua Lindahl .....	1,136 50
Sherman House .....	264 00
Frank Leverett .....	599 28
Miscellaneous .....	12,406 18
Express .....	91 60
J. A. Udden .....	660 06
Fannie Fisher .....	205 05
D. O. Loy .....	264 31
W. F. E. Gurley .....	426 79
H. W. Bokker .....	66 70
W. D. Stryker .....	214 85
E. C. Pace .....	183 25
David Gore .....	45 00
A. B. Hostetter .....	203 20
B. Pullen .....	75 50
LaFayette Funk .....	48 45
J. M. Washburn .....	367 84
Samuel Dysart .....	51 75
Wm. Stewart .....	71 00
Jno. P. Reynolds .....	120 25
B. F. Wyman .....	8 03
<b>Total.....</b>	<b>\$21,618 11</b>

# NATURAL HISTORY COMMITTEE.

## PROFESSOR S. A. FORBES' DEPARTMENT.

Voucher.	To Whom Paid.	Amount.
MISCELLANEOUS.		
339	T. H. Trevett.....	\$18 63
522	Pacific Express Co.....	1 00
611	H. S. Brode.....	100 00
622	C. E. Husk.....	4 96
625	S. Shiga.....	29 05
626	Hugo Kohl.....	58 36
641	L. A. Stave.....	2 59
642	B. D. Holston.....	44 17
643	H. S. Brode.....	17 81
644	American Express Co.....	5 00
708	J. E. Hallinen.....	31 78
714	W. E. Pratt.....	60 01
726	Pacific Express Co.....	9 50
731	Hugo Kahl.....	40 00
734	J. E. Hallinen.....	46 08
739	H. S. Brode.....	7 99
740	Crescent Dist. Co.....	41 64
757	H. S. Brode.....	100 00
762	Hugo Kohl.....	40 00
763	J. E. Hallinen.....	50 00
775	W. A. Snow.....	50 00
776	Lillie M. Hart.....	35 00
843	J. E. Hallinen.....	99 33
890	".....	28 34
892	Henry Trevett.....	56 10
893	A. G. Higgins.....	33 00
895	W. H. Hansen.....	63 00
933	Pacific Express Co.....	14 15
939	J. E. Hallinen.....	50 00
956	Lillie M. Hart.....	35 00
957	Hugo Kohl.....	40 00
958	W. A. Snow.....	50 00
960	J. E. Hallinen.....	71 92
1014	Southwick & Critchley.....	47 81
1015	Sangamon Paper Co.....	10 00
1033	Lillie M. Hart.....	35 00
1036	J. E. Hallinen.....	25 00
1116	Bausch & Lomb Co.....	13 99
1117	Emer & Amend.....	8 70
1160	C. E. Chamblis.....	50 00
1161	Lillie M. Hart.....	35 00

## Natural History Committee—Continued.

Voucher.	To Whom Paid.	Amount.
1162	J. E. Hallinen.....	\$25 00
1163	Lillie Heath.....	25 00
1164	Hugo Kahl.....	40 00
1170	Blake & Co.....	2 55
1171	Withall, Tatum & Co.....	9 63
1172	Hitchcock Lamp Co.....	4 50
1173	Emer & Amend.....	2 53
1174	".....	14 06
1175	Wyckoff, Seamans & Benedict.....	5 00
1177	C. K. Worthen.....	9 38
1178	Southwick & Critchley.....	43 00
1179	".....	6 00
1257	E. Dietzgen & Co.....	6 00
1258	Knowlton & Bennett.....	3 25
1259	American Express Co.....	3 30
1265	J. E. Hallinen.....	50 00
1268	W. A. Snow.....	50 00
1270	Lillie M. Hart.....	40 00
1289	Hugo Kahl.....	40 00
1290	C. E. Chamblis.....	50 00
1291	W. A. Snow.....	50 00
1292	Lillie Heath.....	25 00
1296	Adams Express Co.....	5 00
1456	Emer & Amend.....	3 35
1468	Lillie Heath.....	11 00
1469	W. A. Snow.....	20 00
1471	Hugo Kahl.....	40 00
1513	Lillie M. Hart.....	6 40
1536	C. C. Dorflinger & Sons.....	105 58
1572	Pantagraph Printing Co.....	73 70
1648	Hammond Typewriter Co.....	25 00
1693	J. E. Hallinen.....	75 34
1713	Pettibone, Wells & Co.....	10 00
1762	Emer & Amend.....	10 33
1763	R. S. Wilbur.....	20 00
1764	P. A. Cunningham.....	3 15
1766	Bausch & Lomb Co.....	4 50
1767	Montgomery & Co.....	3 54
1768	Marder, Luse & Co.....	5 40
1752	J. C. Ure.....	67 55
1770	E. H. Sargent & Co.....	19 53
1772	The Gazette.....	37 25
1786	H. A. Ballard.....	8 67
1791	Hugo Kahl.....	61 75
2437	S. W. Shattuck.....	81 18
	Total .....	\$2,762 33
143	C. F. Adams.....	\$175 15
147	".....	100 00
193	".....	100 00

*Natural History Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
212	C. F. Adams .....	\$89 59
245	" .....	100 00
252	" .....	30 20
287	" .....	100 00
317	" .....	32 36
357	" .....	100 00
366	" .....	16 51
408	" .....	100 00
476	" .....	100 00
516	" .....	13 51
536	" .....	100 00
621	" .....	100 00
711	" .....	14 71
730	" .....	100 00
761	" .....	100 00
940	" .....	100 00
1032	" .....	100 00
1114	" .....	85 65
1124	" .....	100 00
1266	" .....	100 00
1470	" .....	100 00
1507	" .....	66 12
1785	" .....	42 94
Total .....		\$2,166 74
168	S. A. Forbes .....	\$9 01
524	" .....	6 20
Total .....		\$15 21
1552	LaFayette Funk .....	\$333 15
1859	" .....	18 65
Total .....		\$351 80
894	Samuel Dysart .....	\$60 00
349	F. M. Woodruff .....	\$45 00
387	" .....	21 10
419	" .....	75 00
488	" .....	75 91
517	" .....	12 72
613	" .....	7 30
735	" .....	25 00
767	" .....	25 00
829	" .....	66 72
970	" .....	36 60
Total .....		\$390 35

*Natural History Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
351	H. E. Summers.....	\$40 00
418	".....	100 00
470	".....	100 00
521	".....	4 28
540	".....	100 00
620	".....	100 00
938	".....	100 00
1035	".....	75 00
1125	".....	100 00
1267	".....	75 00
1455	".....	75 00
1571	".....	19 45
1765	".....	3 00
1790	".....	41 77
Total .....		\$933 50
315	E. Forbes.....	\$17 67
350	".....	25 00
388	".....	18 08
417	".....	25 00
428	".....	19 65
537	".....	25 00
608	".....	28 31
624	".....	25 83
Total .....		\$184 54
286	Wm. Bebb.....	\$40 00
310	".....	25 16
348	".....	20 00
Total .....		\$85 16
519	Chas. A. Hart.....	\$37 46
526	".....	49 58
541	".....	62 50
603	".....	62 50
617	".....	92 43
733	".....	62 50
760	".....	62 50
937	".....	62 50
1034	".....	62 50
1126	".....	62 50
1264	".....	62 50
1549	".....	16 44
Total .....		\$695 91

*Natural History Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
420	F. M. McElfresh.....	\$40 00
471	“.....	29 26
527	“.....	15 34
533	“.....	40 00
606	“.....	27 55
623	“.....	33 86
736	“.....	40 06
	Total.....	\$226 01
518	C. T. Wilder.....	\$35 56
539	“.....	50 00
602	“.....	50 00
605	“.....	100 63
619	“.....	50 00
725	“.....	69 79
732	“.....	25 00
	Total.....	\$380 98

**Recapitulation.**

Miscellaneous.....	\$2,762 33
C. F. Adams.....	2,166 74
S. A. Forbes.....	15 21
L. Funk.....	351 80
Samuel Dysart.....	60 00
F. M. Woodruff.....	390 35
H. E. Summers.....	933 50
E. Forbes.....	184 54
Wm. Bebb.....	85 16
C. A. Hart.....	695 91
F. M. McElfresh.....	226 01
C. T. Wilder.....	380 98
Total.....	\$8,252 53

# EDUCATION COMMITTEE.

Voucher.	To Whom Paid.	Amount.
36	Lillian F. Taylor.....	\$10 00
82	".....	13 00
83	".....	7 60
84	".....	12 60
85	".....	30 90
86	".....	25 50
87	".....	11 86
88	".....	11 66
128	Richard Edwards.....	8 50
181	T. J. Burrill.....	2 00
182	T. C. Clendenin.....	2 00
183	Lillian F. Taylor.....	12 00
184	H. C. Forbes.....	2 00
186	C. J. Kinnie.....	3 00
187	Jno. Hull.....	2 00
188	C. I. Parker.....	2 00
189	Richard Edwards.....	1 50
203	John W. Cook.....	75
281	H. C. Forbes.....	44 67
311	John W. Cook.....	54 75
374	Prang Ed. Co.....	22 92
414	C. J. Kinnie.....	8 25
415	G. R. Shawhan.....	12 16
440	Withall, Tatum & Co.....	45 64
442	Illinois State Journal.....	21 25
464	S. D. Childs & Co.....	6 13
496	Pantagraph Printing Co.....	40 00
502	John Hull.....	167 50
533	Illinois State Journal.....	13 75
558	University of Illinois.....	42 90
564	C. W. Carter.....	27 75
565	Franklin Ed. Co.....	14 03
581	S. W. Shattuck.....	3 42
599	H. F. Hallinen.....	63 10
600	E. H. Sargent.....	6 90
604	Fuller & Fuller.....	35 06
607	H. Londenberger.....	2 20
648	C. W. Carter.....	60 60
649	A. H. Abbott.....	1 88
661	E. Deitzgen.....	11 25
710	".....	11 70
770	W. A. Powers.....	17 38
771	R. King & Co.....	137 00
772	".....	112 33

*Education Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
774	Art Pottery Co .....	\$7 50
778	Pantagraph Printing Co .....	126 18
827	" .....	69 41
845	Mrs. S. Potter .....	44 00
853	W. O. Krohn .....	30 00
854	Prang Ed. Co .....	6 00
855	Pantagraph Printing Co .....	15 65
856	Dan Hardie .....	6 00
857	F. G. Coffen .....	15 25
891	C. Hennecke Co .....	35 43
930	Pantagraph Printing Co .....	40 00
989	W. O. Krohn .....	112 25
990	J. D. Phillips .....	24 10
997	John Hall .....	65 40
1007	State Journal .....	20 00
1008	W. C. Garrard .....	25 00
1012	" .....	15 00
1020	Fuller & Fuller .....	17 85
1021	Grace Peabody .....	3 50
1022	J. D. Phillips .....	28 60
1023	University of Illinois .....	55 36
1024	Louis Wagner .....	12 00
1025	E. Deitzgen & Co .....	14 75
1043	E. Electric Light & B. Co .....	27 75
1044	Ford & Washburn Co .....	35 00
1063	F. G. Coffen .....	7 50
1064	W. A. Powers .....	5 25
1065	Fuller & Fuller .....	1 02
1073	Pantagraph Printing Co .....	51 60
1074	Culver Marble Co .....	85 30
1075	Geo. H. Miller .....	15 00
1076	John W. Cook .....	7 70
1077	Prang Ed. Co .....	1 67
1080	E. McConnell .....	55 00
1085	Robinson & Burr .....	8 49
1090	E. W. Stocker .....	5 90
1110	J. W. Taylor .....	308 88
1156	The Leader .....	32 00
1180	H. Heil Chemical Co .....	38 98
1184	Jno. Hull .....	135 52
1198	State Journal .....	218 00
1207	Carponi Bros. .....	3 35
1208	Withall, Tatum & Co .....	22 72
1209	" .....	17 00
1210	The Gazette .....	4 00
1211	F. G. Coffen .....	4 50
1212	E. McConnell .....	59 60
1213	The Gazette .....	10 00
1237	McIntosh Bat. Co .....	30 00
1244	G. F. Minnick .....	7 00
1269	The Gazette .....	4 65

*Education Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
1271	S. W. Shattuck.....	\$14 93
1272	Hubbard & Son. ....	1 13
1275	Richard Kry Co. ....	36 39
1276	H. N. Patterson. ....	4 25
1277	Withall, Tatum & Co.....	20 00
1282	Thayer & Jackson.....	20 55
1302	The Gazette .....	33 12
1305	T. T. Fredrichs.....	4 95
1306	Geneva Op. Co. ....	20 16
1308	R. Anderson.....	84 00
1316	Am. Bookmart.....	8 15
1317	W. O. Krohn .....	54 84
1320	Richards & Co.....	144 90
1321	C. T. Wilder.....	66 45
1323	B. F. Templeton.....	3 56
1324	G. M. Pillsbury.....	2 25
1329	E. H. Sargent.....	18 85
1330	D. L. Root & Co .....	29 20
1331	S. W. Shattuck.....	1,720 10
1332	Robinson & Burr.....	79 50
1335	J. W. Taylor .....	6 50
1341	R. S. Wilbur.....	8 34
1342	Jno. Hull.....	161 36
1354	Pantagraph Printing Co .....	63 45
1357	Prang Ed. Co .....	29 30
1363	Heil Chemical Co.....	21 56
1364	The Leader.....	3 00
1365	W. A. Olmstead.....	3 23
1366	A. G. Smith.....	19 00
1371	Library Bureau .....	26 57
1372	C. T. Busch .....	9 05
1375	R. Abernathy.....	2 25
1376	H. S. Ogle .....	49 00
1377	D. H. Lloyd.....	69 28
1379	Montgomery & Co .....	10 08
1385	M. A. Earl.....	14 60
1386	Jas. Ingliss.....	124 75
1389	Alex. Levy .....	4 80
1394	C. H. Bradley.....	7 50
1399	G. W. McCluer.....	59 50
1401	W. O. Krohn.....	13 81
1403	Withall, Tatum & Co.....	9 95
1404	Library Bureau.....	25 00
1405	Elektor Manufacturing Co. ....	16 00
1406	C. A. Herme.....	9 13
1407	H. C. Eaton.....	3 67
1408	Emer & Amend. ....	2 00
1409	I. O. Baker.....	3 47
1410	McIntosh Bat. Co .....	14 45
1411	P. Chipman.....	18 75
1412	O. C. Woolsey.....	2 63

*Education Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
1413	E. Deitzgen & Co.....	\$9 99
1414	H. E. Bartlett.....	8 40
1417	Stanford Hall.....	8 00
1418	G. E. Morrow.....	13 90
1419	G. C. Miller.....	10 50
1420	W. A. Stowell.....	3 60
1421	May Leaton.....	10 00
1422	D. L. Roots & Son.....	46 58
1423	E. W. Stoker.....	72 30
1424	C. T. Wilder.....	10 00
1425	D. H. Lloyd & Son.....	3 90
1426	B. P. Colton.....	27 85
1427	Jno. Hull.....	128 58
1428	Withall, Tatum & Co.....	2 35
1429	Agricultural Experiment Station.....	9 36
1430	R. Andrews.....	11 16
1431	Richards & Co.....	8 57
1432	Cunningham & Koloid.....	31 60
1433	Agricultural Experiment Station.....	4 90
1434	D. L. Roots & Son.....	9 00
1435	G. C. Miller.....	52 50
1436	C. N. Clark & Co.....	27 92
1437	Pantagraph Printing Co.....	203 65
1438	Robinson & Burr.....	25 59
1439	C. W. Scribner.....	8 61
1440	D. H. Lloyd.....	5 09
1441	Southwick & Critchley.....	549 75
1442	" ".....	7 00
1443	Jas. Ingliss.....	64 15
1445	G. E. Morrow.....	8 77
1446	G. C. Miller.....	1 80
1447	".....	37 50
1449	N. O. Lawson.....	22 50
1450	J. R. Gaines.....	12 75
1451	R. C. Vial.....	6 65
1452	C. N. Clark & Co.....	69 50
1453	E. McConnell.....	42 50
1454	H. E. Summers.....	7 90
1465	Bacon, Mittendorf & Hall.....	2 50
1466	Wyckoff, Seamans & Benedict.....	8 00
1501	B. N. Ramsay.....	14 35
1512	R. S. Wilbur.....	9 26
1519	C. N. Clark & Co.....	8 75
1520	A. B. Loomis.....	18 50
1521	Jno. A. Lowry.....	3 50
1522	The Gazette.....	40 80
1523	Bacon, Mittendorf & Hall.....	22 78
1524	J. M. White.....	19 97
1525	W. L. Pillsbury.....	46 70
1526	Bacon, Mittendorf & Hall.....	376 72

*Education Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
1575	Bausch & Lomb Co. ....	\$8 63
1582	R. H. Forbes . . . . .	19 02
1583	Richards & Co . . . . .	3 50
1584	General Electric Co. ....	83 65
1585	W. A. Powers . . . . .	6 25
1586	F. F. Fredrich . . . . .	9 20
1587	H. D. Bartlett . . . . .	6 39
1588	The Gazette . . . . .	76 95
1589	Thos. Naughton . . . . .	148 13
1590	Lillie M. Hart . . . . .	7 65
1591	A. N. Talbott . . . . .	11 05
1592	C. J. Butterfield . . . . .	11 50
1593	Grace Peabody . . . . .	2 50
1594	L. P. Atwood . . . . .	21 50
1595	G. P. Clinton . . . . .	9 95
1596	A. L. Kuehmstd. . . . .	13 26
1597	E. C. Vial . . . . .	5 32
1598	University of Illinois . . . . .	29 75
1599	Jno. W. Cook . . . . .	21 00
1600	E. J. Lake . . . . .	51 71
1601	D. H. Lloyd & Son . . . . .	5 00
1602	Strickle Bros . . . . .	5 20
1603	J. B. Lippincott . . . . .	5 00
1604	E. H. Sargent & Co. . . . .	14 26
1605	Alice C. Fell . . . . .	21 00
1606	Funk & Klauer . . . . .	312 15
1607	J. M. White . . . . .	96 90
1608	Henry Bevis . . . . .	8 45
1609	C. E. Ela . . . . .	16 00
1610	R. Anderson . . . . .	12 66
1611	Richards & Co. . . . .	6 50
1612	D. L. Roots & Sons . . . . .	3 25
1613	B. H. Swenson . . . . .	18 26
1614	Sharp & Smith . . . . .	5 75
1615	Prang Ed. Co. . . . .	4 00
1616	Stanford Hall . . . . .	7 12
1617	J. E. Griswold . . . . .	21 60
1618	J. W. Queen . . . . .	47 65
1619	Pantagraph Printing Co. . . . .	16 50
1620	McIntosh Bat. Co. . . . .	35 33
1621	O. E. Strehlon . . . . .	22 70
1627	H. S. Brode . . . . .	27 47
1628	S. W. Shattuck . . . . .	80 00
1629	L. Manasse . . . . .	9 00
1639	Jno. Hull . . . . .	337 64
1640	A. O. Norton . . . . .	5 13
1641	Strickle Bros . . . . .	160 10
1642	World Sign Co. . . . .	40 00
1643	P. A. Coen & Son . . . . .	9 40
1653	J. W. Cook . . . . .	25 70
1659	Pantagraph Printing Co. . . . .	316 05

*Education Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
1667	Crane Co.....	\$113 31
1694	Pettibone & Wells.....	11 35
1701	R. S. Wilbur.....	28 00
1702	W. K. Yeakel.....	1 80
1703	H. O. Woodworth.....	52 20
1719	Garvin Machine Co.....	9 38
1720	R. W. Stark.....	2 00
1721	E. J. Lake.....	8 55
1722	Fuller & Fuller.....	6 90
1723	G. E. Morrow.....	51 00
1724	Puster Manufacturing Co.....	47 00
1725	The Gazette.....	173 02
1726	G. P. Clinton.....	14 50
1727	Western Electric Co.....	10 16
1728	W. E. In. Co.....	105 90
1729	S. W. Shattuck.....	125 65
1730	Robinson & Burr.....	3 97
1731	F. P. Andrews.....	5 75
1746	Richards & Co.....	94 90
1769	J. M. White.....	5 50
1754	F. H. Cornell.....	5 00
1755	W. E. Sanford.....	15 00
1756	J. W. Taylor.....	128 28
1757	A. Tellheimer.....	25 50
1758	R. H. Forbes.....	14 08
1759	E. W. Stocker.....	28 20
1760	G. W. McCluer.....	5 20
1761	G. W. Herring.....	10 50
1771	W. O. Krohn.....	45 69
1800	S. B. Wait.....	9 00
1806	Duncan & Johnstone.....	11 25
1807	L. McManus.....	22 50
1808	H. H. Brancher.....	3 60
1809	T. J. Burrill.....	1 85
1810	S. C. Shielvig.....	5 00
1811	C. W. Scribner.....	10 25
1812	P. M. Huckle.....	13 86
1813	Bacon, Mittendorf & Hall.....	179 85
1815	T. H. Trevett.....	1 30
1816	F. D. Gardner.....	4 90
1817	Dailey & Anderson.....	17 85
1818	R. Anderson.....	46 50
1819	S. C. Skielvig.....	7 25
1825	Jno. A. Lowry.....	5 95
1826	The Gazette.....	49 45
1846	R. Anderson.....	11 00
1847	Richards & Co.....	21 96
1848	J. D. Crawford.....	48 85
1861	Jno. Hull.....	89 05
1866	World Sign Co.....	2 15
1869	Pantagraph Printing Co.....	8 20

*Education Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
1872	J. McCann .....	\$1 80
1873	E. H. Sargent & Co. ....	13 86
1875	Jno. Hull .....	185 30
1886	W. O. Krohn .....	9 54
1897	McIntosh Bat. Co. ....	2 75
1913	E. H. Sargent & Co. ....	66 29
1915	Jno. Hull .....	371 31
1919	J. A. Keith .....	15 15
1920	B. W. Elsendrath .....	4 75
1921	Pages Lath & B. Co. ....	9 11
1922	E. H. Sargent .....	2 88
1923	Puster Manufacturing Co .....	3 50
1924	Western Electric Co. ....	75 08
1925	E. C. Bennett .....	25 00
1926	S. W. Shattuck .....	51 75
1927	C. O. Butterfield .....	1 75
1928	Pantagraph Printing Co. ....	2 40
1941	C. H. Besley .....	69 18
1942	G. W. McCluer .....	20 08
1943	Queen & Co. ....	18 39
1944	D. W. Shea .....	61 19
1948	B. V. Swenson .....	48 76
1974	C. E. Ela .....	24 50
1980	Architectural Department, University of Illinois .....	285 34
1984	A. M. Talbott .....	44 35
1986	McIntosh Bat. Co. ....	2 00
1987	Bacon, Mittendorf & Hall .....	17 90
1988	The Gazette .....	2 00
1989	Dalley & Anderson .....	72 79
1990	Henry Bevis .....	58 65
1991	S. W. Shattuck .....	80 00
1994	Robinson & Burr .....	1 55
2017	H. E. Summers .....	10 70
2022	Chas. H. Besley .....	6 01
2023	Western Electric Co. ....	187 20
2024	The Gazette .....	68 33
2025	Geo. B. Carpenter .....	20 25
2026	D. W. Shea .....	2 50
2027	S. W. Palmer .....	41 00
2028	S. W. Parr .....	41 50
2029	I. O. Baker .....	27 90
2084	Sefton Bros .....	3 18
2087	M. C. Meader .....	12 62
2088	Crane & Co. ....	19 00
2127	A. J. Barton .....	39 80
2171	Jno. Hull .....	13 40
2358	Jno. C. Ure .....	20 00
2389	W. F. Rocheleam .....	25 25
2493	McIntosh Bat. Co. ....	5 00
2531	Chas. Hermé .....	16 35
2533	J. M. White .....	64 63

*Education Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
2534	G. W. Parker.....	\$12 81
2535	H. E. Parker.....	21 00
2536	G. W. McCluer.....	9 85
2537	C. H. Besley.....	2 85
2538	W. O. Krohn.....	8 65
2607	The Gazette.....	13 75
2608	E. Deitzgen.....	6 25
2649	Richards & Co.....	10 54
2652	J. M. White.....	9 70
2655	D. L. Roots & Son.....	10 25
2705	The Gazette.....	35 02
1849	E. R. Smith.....	25 00
434	University of Illinois.....	18 03
	Total.....	\$14,891 52
1	E. E. Chester.....	\$5 00
127	".....	16 75
214	".....	15 00
324	".....	10 00
465	".....	30 00
921	".....	12 50
988	".....	6 50
1096	".....	41 65
1188	".....	17 00
1325	".....	5 00
1488	".....	7 50
2725	".....	10 00
	Total.....	\$176 90
92	J. K. Dickirson.....	\$15 00
125	".....	5 00
216	".....	15 00
322	".....	18 75
	Total.....	\$53 75
305	LaFayette Funk.....	\$5 75
1552	".....	50 75
1795	".....	36 58
1859	".....	65 00
1962	".....	7 03
	Total.....	\$165 11
72	J. M. Washburn.....	\$15 00
116	".....	15 55
	Total.....	\$30 55

*Education Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
59	S. W. Johns.....	\$10 00
118	“.....	10 00
	Total .....	\$20 00
234	David Gore.....	\$19 50
1280	W. D. Stryker.....	1 85
280	J. Harley Bradley.....	15 00
89	Wm. Jenkins.....	\$12 46
185	“.....	3 00
251	“.....	104 17
293	“.....	208 34
313	“.....	57 99
356	“.....	208 33
406	“.....	208 33
426	“.....	67 12
441	“.....	54 04
469	“.....	208 34
530	“.....	58 44
532	“.....	208 33
559	“.....	56 19
640	“.....	208 33
658	“.....	62 71
692	“.....	208 34
727	“.....	99 72
759	“.....	208 33
837	“.....	98 62
860	“.....	208 33
887	“.....	162 04
948	“.....	208 34
995	“.....	140 27
1031	“.....	208 33
1068	“.....	157 23
1128	“.....	208 33
1189	“.....	152 90
1248	“.....	208 34
1274	“.....	137 76
1400	“.....	208 33
1444	“.....	51 39
1718	“.....	40 85
1887	“.....	88 87
1969	“.....	88 87
2073	“.....	88 20
2173	“.....	84 92
2316	“.....	88 65
2520	“.....	22 50
	Total .....	\$4,895 58

*Education Committee—Concluded.*

Voucher.	To Whom Paid.	Amount.
117	Sherman House.....	\$23 00
161	".....	31 25
343	".....	8 25
499	".....	12 00
578	".....	6 50
1000	".....	48 25
1167	".....	18 10
1304	".....	2 00
1527	".....	42 50
Total .....		\$191 85

**Recapitulation.**

Miscellaneous.....	\$14,891 52
E. E. Chester.....	176 90
J. K. Dickirson.....	53 75
L. Funk .....	165 11
J. M. Washburn.....	30 55
S. W. Johns.....	20 00
David Gore .....	19 50
W. D. Stryker.....	1 85
J. H. Bradley.....	15 00
Wm. Jenkins.....	4,895 58
Sherman House.....	191 85
Total.....	\$20,461 61

## MAPS AND DRAWINGS COMMITTEE.

Voucher.	To Whom Paid.	Amount.
73	Samuel Dysart.....	\$15 00
207	".....	35 00
325	".....	25 90
449	".....	48 10
576	".....	80 00
702	".....	30 00
1081	".....	2 25
1168	".....	11 50
1287	".....	76 10
1496	".....	20 00
Total .....		\$343 85
63	W. D. Stryker.....	\$20 00
111	".....	10 00
144	".....	5 00
369	".....	15 00
452	".....	10 00
919	".....	5 00
1262	".....	5 00
Total .....		\$70 00
55	B. F. Wyman.....	\$10 00
120	".....	10 00
217	".....	5 00
466	".....	20 00
583	".....	5 00
916	".....	5 00
1307	".....	10 00
Total.....		\$65 00
214	E. E. Chester.....	\$10 00
577	".....	25 10
816	".....	10 00
921	".....	10 00
1188	".....	12 00
1488	".....	5 50
Total.....		\$72 60

*Maps and Drawings Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
305	LaFayette Funk.....	\$5 00
562	“.....	20 50
745	“.....	7 00
	Total.....	\$32 50
234	David Gore.....	\$5 00
454	“.....	10 00
	Total.....	\$15 00
117	Sherman House.....	\$28 00
161	“.....	36 25
343	“.....	14 50
499	“.....	35 25
578	“.....	7 25
752	“.....	7 00
1000	“.....	23 25
1167	“.....	9 50
1304	“.....	61 75
1527	“.....	28 50
	Total.....	\$251 25
934	Rand, McNally & Co.....	\$2 40
1570	“.....	3,471 25
2183	“.....	308 25
	Total.....	\$3,781 90
462	J. W. Taylor.....	\$25 00
493	“.....	30 00
753	“.....	875 00
1107	“.....	235 00
1111	“.....	648 00
2014	“.....	100 00
	Total.....	\$1,913 00
MISCELLANEOUS.		
1003	Chas. Hansel.....	\$7 00
722	L. O. Baker.....	1 70
1255	E. C. Pace.....	16 00
486	Jno. A. Lowry.....	27 00
2694	Frank Leverett.....	7 50
	Total.....	\$59 20

*Maps and Drawings Committee—Continued.***Recapitulation.**

Samuel Dysart.....	\$343 85
W. D. Stryker.....	70 00
B. F. Wyman.....	65 00
E. E. Chester.....	72 60
LaFayette Funk.....	32 50
David Gore .....	15 00
Sherman House .....	251 25
Rand, McNally & Co.....	3,781 90
J. W. Taylor .....	1,913 00
Miscellaneous.....	59 20
Total .....	<b>\$6,604 30</b>

# MAPS AND DRAWINGS COMMITTEE.

## C. W. ROLFE'S DEPARTMENT.

Voucher.	To Whom Paid.	Amount.
MISCELLANEOUS.		
171	J. G. Mosier.....	\$125 56
173	Ira J. Stoddard.....	69 15
174	J. E. Hallinen.....	65 49
175	E. C. Ellison.....	30 80
222	J. G. Mosier.....	119 00
223	J. C. Turner.....	109 00
228	J. E. Hallinen.....	105 95
229	J. C. Turner.....	40 98
230	E. C. Ellison.....	50 89
232	Edward Jerry.....	19 85
233	E. C. Eidman.....	31 95
250	I. J. Stoddard.....	104 13
272	J. C. Turner.....	104 60
273	Ira J. Stoddard.....	55 28
274	Edward Jerry.....	80 24
275	E. C. Ellison.....	84 32
276	J. G. Mosier.....	79 36
283	C. B. Klingelhoef.....	114 00
285	J. E. Hallinen.....	92 88
319	E. C. Eidman.....	106 30
320	Edward Jerry.....	67 00
321	E. C. Ellison.....	80 55
332	J. C. Turner.....	106 56
334	R. M. Wood.....	73 38
335	C. B. Klingelhoef.....	109 50
336	E. C. Eidman.....	105 10
337	J. G. Mosier.....	93 27
338	J. E. Hallinen.....	93 21
341	Thos. Barclay.....	66 15
342	W. M. Hay.....	108 25
375	R. M. Hood.....	59 80
376	W. A. Dunaway.....	40 35
378	J. C. Turner.....	108 16
379	H. J. Burt.....	95 03
380	Thos. Barclay.....	99 99
381	Jerry Edwards.....	76 25
382	Champaign Gazette.....	5 75
383	E. C. Eidman.....	104 09

*Maps and Drawings Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
384	J. G. Mosier.....	\$79 90
385	W. M. Hay.....	107 89
386	J. E. Hallinen.....	72 78
394	C. B. Klingelhoef.....	111 00
423	J. C. Turner.....	118 05
424	C. B. Klingelhoef.....	80 47
427	R. M. Hood.....	113 05
430	E. C. Eidman.....	104 05
432	J. G. Mosier.....	79 10
435	W. W. Danley.....	64 91
436	H. J. Burt.....	109 27
437	J. E. Hallinen.....	90 96
438	Edward Jerry.....	85 00
439	Thos. Barclay.....	100 17
443	W. M. Hay.....	99 15
444	W. A. Dunaway.....	80 89
504	M. A. Earl.....	26 02
505	W. M. Hay.....	102 21
506	H. J. Burt.....	114 65
507	R. M. Hood.....	107 00
508	E. C. Eidman.....	105 95
509	Edward Jerry.....	89 87
510	Thos. Barclay.....	70 75
511	C. B. Klingelhoef.....	91 25
512	J. C. Turner.....	115 00
513	W. W. Danley.....	112 01
514	J. G. Mosier.....	79 90
515	W. A. Dunaway.....	84 94
584	".....	110 35
585	J. C. Turner.....	97 50
586	H. J. Burt.....	115 39
587	W. W. Danley.....	98 88
588	E. C. Eidman.....	107 25
589	J. G. Mosier.....	57 20
590	Thos. Barclay.....	92 60
591	R. M. Hood.....	110 74
592	M. A. Earl.....	111 77
593	W. M. Hay.....	82 69
595	C. B. Klingelhoef.....	98 35
596	Edward Jerry.....	91 65
598	J. A. Udden.....	75 00
664	Edward Jerry.....	82 40
666	W. W. Danley.....	112 25
667	J. C. Turner.....	117 59
668	E. C. Eidman.....	107 15
669	R. M. Hood.....	113 00
670	M. A. Earl.....	121 31
672	Knowlton & Bennett.....	14 00
673	Thos Barclay.....	70 88
674	W. M. Hay.....	111 33
675	H. J. Burt.....	116 77

*Maps and Drawings Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
676	J. G. Mosier.....	\$78 00
677	C. B. Klingelhoef.....	111 90
709	J. G. Mosier.....	89 66
712	Thos. Barclay.....	50 95
713	W. W. Danley.....	97 30
715	Champaign Gazette.....	6 44
716	H. J. Burt.....	111 91
718	J. C. Turner.....	120 78
719	C. B. Klingelhoef.....	17 50
720	M. A. Earl.....	112 25
721	R. M. Hood.....	27 00
723	E. C. Eidman.....	120 65
724	W. A. Dunaway.....	229 62
728	J. A. Udden.....	97 00
729	L. S. Ross.....	60 00
742	W. M. Hay.....	84 53
789	Lydia Mosier.....	3 30
791	L. S. Ross.....	95 00
795	J. G. Mosier.....	122 31
797	H. J. Burt.....	75 00
800	Thos. Barclay.....	75 05
801	Edward Jerry.....	70 50
802	J. C. Turner.....	103 35
804	W. M. Hay.....	115 15
805	E. C. Eidman.....	115 00
821	Edward Jerry.....	87 90
875	Lydia Mosier.....	14 40
876	J. G. Mosier.....	115 93
877	W. A. Dunaway.....	79 30
878	W. M. Hay.....	90 96
879	E. C. Eidman.....	96 90
881	H. J. Burt.....	73 00
882	Thos. Barclay.....	23 85
883	J. C. Turner.....	75 00
936	W. W. Danley.....	16 00
962	W. M. Hay.....	93 99
963	J. C. Turner.....	75 00
964	Lydia Mosier.....	7 05
965	W. A. Dunaway.....	78 50
966	H. J. Burt.....	71 00
994	J. G. Mosier.....	92 26
1052	W. A. Dunaway.....	72 00
1053	W. M. Hay.....	77 30
1054	H. J. Burt.....	75 00
1055	J. C. Turner.....	75 00
1056	The Gazette.....	12 40
1057	W. W. Danley.....	6 00
1058	O. Oldham.....	15 80

*Maps and Drawings Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
1059	A. W. Rea.....	\$45 00
1060	J. G. Mosier.....	85 00
1061	Lydia Mosier.....	30 60
	Total .....	\$11,669 65
137	W. & L. E. Gurley...	\$81 00
236	" ".....	75 00
269	" ".....	45 00
597	" ".....	17 61
1051	" ".....	1 34
	Total .....	\$219 95
136	L. Manasse.....	160 00
238	" ".....	120 00
270	" ".....	120 00
	Total .....	\$400 00
237	Rand, McNally & Co.....	\$15 00
737	" " ".....	346 02
	Total .....	\$361 02
1350	Louise and Jno. Barwick.....	\$150 00
1543	" ".....	150 00
1741	" ".....	250 00
1776	" ".....	300 00
	Total.....	\$850 00
1552	L. Funk.....	\$150 00
141	C. W. Rolfe .....	\$374 14
160	" ".....	85 00
200	" ".....	85 00
231	" ".....	8 53
246	" ".....	85 00
284	" ".....	12 65
288	" ".....	85 00
318	" ".....	9 91
354	" ".....	85 00
395	" ".....	14 55
407	" ".....	85 00
445	" ".....	9 56
468	" ".....	85 00
503	" ".....	4 54
535	" ".....	85 00
594	" ".....	7 84
628	" ".....	85 00

*Maps and Drawings Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
671	C. W. Rolfe .....	\$10 99
690	" .....	85 00
717	" .....	6 77
758	" .....	85 00
792	" .....	5 62
861	" .....	85 00
880	" .....	38 20
947	" .....	85 00
961	" .....	30 53
1026	" .....	85 00
1066	" .....	44 00
1127	" .....	85 00
1245	" .....	85 00
1482	" .....	8 05
Total.....		\$1,945 88

**Recapitulation.**

Miscellaneous.....	\$11,669 65
W. & L. E. Gurley.....	219 95
L. Manasse.....	400 00
Rand, McNally & Co .....	361 02
L. & J. Barwick.....	850 00
L. Funk .....	150 00
C. W. Rolfe.....	1,945 88
Total.....	\$15,596 50

# STATISTICS.

Voucher.	To Whom Paid.	Amount.
191	J. D. Wright.....	\$95 83
247	".....	125 00
289	".....	125 00
358	".....	125 00
405	".....	125 00
477	".....	125 00
544	".....	125 00
631	".....	125 00
657	".....	6 50
697	".....	125 00
Total.....		\$1,102 33
192	H. R. Mitchell.....	\$76 67
248	".....	100 00
290	".....	100 00
359	".....	100 00
493	".....	100 00
478	".....	100 00
545	".....	100 00
632	".....	100 00
696	".....	100 00
848	".....	97 08
1715	".....	100 00
Total.....		\$1,073 75
190	T. K. Gore.....	\$76 67
249	".....	100 00
291	".....	100 00
353	".....	100 00
389	".....	42 39
402	".....	100 00
456	".....	53 27
479	".....	100 00
546	".....	100 00
633	".....	100 00
695	".....	100 00
803	".....	35 90
847	".....	100 00
968	".....	50 00
Total.....		\$1,158 23

*Statistics—Concluded.*

Voucher.	To Whom Paid.	Amount.
292	Ed Ryan.....	\$75 00
355	".....	100 00
401	".....	100 00
480	".....	100 00
548	".....	100 00
634	".....	100 00
694	".....	100 00
	Total .....	\$675 00
352	T. J. Tossey .....	\$100 00
400	".....	100 00
481	".....	100 00
547	".....	100 00
635	".....	100 00
699	".....	100 00
	Total .....	\$600 00
235	Willis Smith .....	\$8 33
258	".....	8 33
301	".....	8 34
363	".....	8 34
405	".....	8 33
482	".....	8 34
549	".....	8 33
636	".....	8 33
698	".....	8 34
	Total .....	\$75 01
<b>MISCELLANEOUS.</b>		
261	W. C. Garrard.....	\$50 00
1203	L. E. Wheeler.....	13 75
1774	J. C. Conkling .....	25 00
1795	L. Funk .....	2 00
	Total .....	\$90 75

**Recapitulation.**

J. D. Wright.....	\$1,102 33
H. R. Mitchell.....	1,073 75
T. K. Gore .....	1,158 23
Ed Ryan.....	675 00
T. J. Tossey.....	600 00
Willis Smith.....	75 01
Miscellaneous.....	90 75
Total.....	\$4,775 07

## LIVE STOCK ACCOUNT.

<i>Dr.</i>	
To amount State appropriation.....	\$40,000 00
<i>Cr.</i>	
By amount charged for administration.....	\$3,000 00
"    paid freight on live stock.....	3,308 78
"    "    horses, 37%.....	12,464 29
"    "    cattle, 30%.....	10,106 17
"    "    hogs, 15%.....	5,053 09
"    "    sheep, 12%.....	4,042 47
"    "    poultry, 6%.....	2,021 23
"    balance on hand.....	3 97
Total.....	\$40,000 00

# **AGRICULTURAL COMMITTEE.**

Voucher.	To Whom Paid.	Amount.
<b>MISCELLANEOUS.</b>		
799	Searing & Dillinger.....	\$8 50
925	J. J. Butler.....	31 87
927	A. E. Russell.....	52 25
953	A. Neeper.....	25 00
1017	J. W. McHenry.....	54 55
1017	George G. Bates.....	8 95
1099	E. Marsh.....	36 00
1153	Horton, Pfeiffer & Lee.....	106 00
1196	Beede Bros.....	41 78
1215	W. A. Bicket.....	58 70
1216	Daniel Hill.....	33 76
1217	J. H. Ewing.....	7 70
1225	T. P. Chester.....	11 20
1226	E. O. Chester.....	53 64
1310	Cameron, Amberg & Co.....	5 00
1333	Hibbard, Spencer & Co.....	6 32
1336	".....	29 42
1360	A. W. Crawford.....	25 00
1393	E. O. Chester.....	27 30
1458	E. A. Vittum.....	92 45
1460	H. P. Edmonds.....	10 77
1461	W. R. Hostetter.....	9 85
1462	E. A. Vittum.....	141 60
1463	The Fair.....	12 28
1476	Eagle Bros. & Co.....	17 11
1516	Cameron, Amberg & Co.....	16 75
1537	Hibbard, Spencer & Co.....	50 69
1567	A. F. Cox.....	250 00
1568	World's Columbian Exposition.....	100 00
1634	E. O. Chester.....	9 10
1650	Owen, Lord & Co.....	1 00
1668	Eagle Bros & Co.....	3 37
1684	T. P. Chester.....	8 90
1708	J. W. Bailey.....	14 50
1709	O. P. Chester.....	4 32
1744	Brinks' Chicago City Express Co.....	47 46
1752	John C. Ure.....	16 00
1906	S. A. Lancaster.....	5 00
1946	E. A. Vittum.....	16 63
1977	Daniel Hill.....	25 00
1982	D. H. Freeman.....	8 40
2006	W. A. Burdick.....	23 00

*Agricultural Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
2007	G. E. Morrow.....	\$1 50
2037	Orange Judd Co.....	41 52
2170	C. C. Judy.....	10 00
2200	N. Weston.....	10 20
2201	W. A. Burdick.....	40 75
2202	M. Plummer & Co.....	22 83
2209	N. B. Reed.....	21 40
2225	A. F. Cox.....	250 00
2216	Robert Shedden.....	50 00
2218	Sommer & Pierik.....	100 00
2219	W. A. Young.....	46 50
2223	D. H. Freeman.....	117 35
2274	A. E. DuBois.....	31 50
2278	H. P. Edmonds.....	53 60
2287	E. A. Vittum.....	74 70
2293	T. Holmes.....	1 75
2294	Nick Berks.....	4 75
2295	George Barber.....	7 60
2296	J. L. Reid.....	8 00
2299	J. C. Ure.....	55 50
2301	World's Columbian Exposition.....	83
2339	C. S. Eaton.....	14 25
2341	George Hesing.....	9 00
2355	Cook & Rathbone.....	13 20
2359	M. Plummer & Co.....	28 54
2528	H. G. Teel.....	6 25
2530	D. H. Freeman.....	19 75
2539	H. P. Edmonds.....	14 17
1856	J. M. Richart.....	11 25
2729	Boatman & Duckles.....	10 00
	Total.....	<b>\$2,583 81</b>
1319	Illinois Glass Co.....	<b>\$474 07</b>
1351	".....	123 16
2356	".....	20 25
	Total.....	<b>\$617 48</b>
1686	Marshall Field & Co.....	<b>\$117 99</b>
1197	".....	25 45
1347	".....	35 74
1457	".....	83 23
1649	".....	69 69
2280	".....	26 48
	Total.....	<b>\$358 58</b>
569	E. S. Fursman.....	<b>\$128 50</b>
850	".....	299 97
918	".....	50 00

*Agricultural Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
1004	E. S. Fursman.....	\$50 00
1087	".....	50 00
1094	".....	38 13
1190	".....	50 00
1253	".....	5 32
1279	".....	80 76
1517	".....	109 70
1518	".....	100 00
18-8	".....	75 00
1901	".....	6 25
2284	".....	220 36
2336	".....	50 00
2363	".....	50 00
2375	".....	50 00
2410	".....	50 00
2529	".....	22 50
Total.....		\$1,486 49
851	Paul Lietz.....	\$100 00
852	".....	100 00
Total.....		\$200 00
570	L. E. Wyman.....	\$25 50
750	".....	47 07
886	".....	19 43
Total.....		\$92 00
1334	A. Dickinson Seed Co.....	\$7 05
1545	".....	142 30
1666	".....	6 75
Total.....		\$156 10
117	Sherman House.....	\$21 75
161	".....	15 50
499	".....	27 00
578	".....	39 00
1000	".....	51 75
1167	".....	75 75
1304	".....	105 00
1527	".....	45 50
Total.....		\$381 25
1397	R. N. Ramsay.....	\$719 50
1417	".....	806 30
1501	".....	653 15
1506	".....	252 50

*Agricultural Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
1546	R. N. Ramsay.....	\$245 95
1554	".....	226 50
	Total.....	\$2,903 90
1222	Jno. P. Reynolds.....	\$364 64
1227	".....	236 46
1234	".....	84 03
1285	".....	265 25
1298	".....	471 65
1349	".....	602 70
	Total.....	\$2,024 73
562	L. Funk.....	\$5 25
745	".....	15 00
986	".....	5 50
1552	".....	41 41
1795	".....	9 38
	Total.....	\$76 54
563	W. D. Stryker.....	\$40 85
766	".....	30 75
919	".....	5 00
1280	".....	5 00
	Total.....	\$81 60
75	D. W. Vittum.....	\$5 00
810	".....	35 90
812	".....	50 00
1001	".....	46 00
1095	".....	28 00
1105	".....	11 10
1187	".....	41 10
1224	".....	40 79
1328	".....	87 85
1361	".....	48 00
1391	".....	32 25
1483	".....	138 35
1485	".....	18 90
1497	".....	132 20
1700	".....	30 64
2004	".....	11 85
	Total.....	\$712 93
561	A. B. Hostetter.....	\$93 25
653	".....	30 95
741	".....	34 75

*Agricultural Committee—Continued.*

Voucher.	To Whom Paid.	Amount.
904	A. B. Hostetter.....	\$30 72
905	“.....	7 05
1149	“.....	14 70
1249	“.....	17 30
1300	“.....	85 30
1344	“.....	8 21
1378	“.....	9 80
1493	“.....	69 68
1547	“.....	6 85
1788	“.....	9 25
1900	“.....	11 90
2005	“.....	13 90
Total.....		\$443 61
574	S. W. Johns.....	\$136 60
773	“.....	24 75
1082	“.....	20 75
1148	“.....	2 00
Total.....		\$184 10
72	J. M. Washburn.....	\$16 05
116	“.....	13 05
704	“.....	19 50
1301	“.....	12 10
1459	“.....	22 35
Total.....		\$83 05
583	B. F. Wyman.....	\$10 00
748	“.....	40 05
916	“.....	5 00
1086	“.....	20 58
1157	“.....	5 50
1307	“.....	94 20
1355	“.....	6 54
1495	“.....	12 50
1531	“.....	6 95
Total.....		\$201 32
751	E. E. Chester.....	\$15 00
921	“.....	10 00
988	“.....	5 00
1096	“.....	20 00
1188	“.....	17 00
1325	“.....	58 25
1488	“.....	28 30
2725	“.....	10 00
Total.....		\$163 55

*Agricultural Committee—Concluded.*

Voucher.	To Whom Paid.	Amount.
706	B. Pullen .....	\$47 54
908	" .....	5 50
1042	" .....	6 00
	Total .....	\$59 04
572	W. H. Fulkerson .....	\$13 50
746	" .....	27 00
984	" .....	30 75
	Total .....	\$71 25
1273	John Virgin .....	\$4 79
2272	" .....	33 92
	Total .....	\$43 71
779	E. B. David .....	\$33 00
1287	S. Dysart .....	3 40

**Recapitulation.**

Miscellaneous .....	\$2,583 81
Illinois Glass Co. ....	617 48
Marshall Field & Co. ....	358 58
E. S. Fursman .....	1,486 49
Paul Lietz .....	200 00
L. E. Wyman .....	92 00
Albert Dickinson Seed Co. ....	156 10
Sherman House .....	381 25
R. N. Ramsay .....	2,903 90
Jno. P. Reynolds .....	2,024 73
L. Funk .....	76 54
W. D. Stryker .....	81 60
D. W. Vittum .....	754 93
A. B. Hostetter .....	443 61
S. W. Johns .....	184 10
J. M. Washburn .....	83 05
B. F. Wyman .....	201 32
E. E. Chester .....	163 55
B. Pullen .....	59 04
W. H. Fulkerson .....	71 25
John Virgin .....	43 71
E. B. David .....	33 00
Samuel Dysart .....	3 40
Total .....	\$13,006 44

# HORTICULTURE.

Voucher.	To Whom Paid.	Amount.
MISCELLANEOUS.		
41	F. I. Mann .....	\$5 38
42	E. A. Riehl .....	16 59
43	R. T. Fry .....	4 18
44	A. C. Hammond .....	7 20
45	Arthur Bryant .....	6 25
46	H. M. Dunlap .....	7 70
533	Illinois State Journal .....	1 50
756	Jno. M. Durham .....	14 85
826	C. G. Cloud .....	45 00
833	F. Newhall & Sons .....	344 21
841	G. D. Slanker .....	87 28
941	Pitcher & Manda .....	41 65
1093	W. Kuecher & Co. ....	75 60
1097	Lang Bros .....	22 50
1281	Horton, Pfeiffer & Lee .....	4 46
1478	Thayer & Jackson .....	9 25
1535	Pitkin & Brooks .....	46 67
1569	Pitcher & Manda .....	95 60
1635	Denison Manufacturing Co. ....	11 48
1744	Brink's Chicago City Express Co. ....	4 00
1844	E. H. Hunt .....	51 01
1970	J. C. Vaughan .....	7 95
1983	" .....	8 50
2016	Jno. Grohn .....	27 00
2020	Pitcher & Manda .....	77 00
2079	E. H. Hunt .....	29 60
2080	Geo. Wittbold .....	136 00
2179	A. W. Mapes .....	6 00
2210	Pitkin & Brooks .....	10 92
2297	American Express Co. ....	44 12
2387	Portland Lawn Sprinkler .....	12 00
2388	M. Field & Co. ....	81 09
	Total .....	\$1,342 54
216	J. K. Dickirson .....	\$10 00
322	" .....	23 25
580	" .....	16 50
2737	" .....	17 25
	Total .....	\$67 00
1542	A. B. Hostetter .....	\$13 80

*Horticulture—Continued.*

Voucher.	To Whom Paid.	Amount.
68	E. B. David.....	\$25 25
124	".....	9 50
271	".....	15 00
377	".....	14 50
500	".....	31 50
779	".....	21 32
971	".....	32 26
1100	".....	30 00
1494	".....	7 00
2709	".....	10 00
2732	".....	32 65
	Total.....	\$228 98
314	C. N. Dennis.....	\$62 25
372	".....	57 45
425	".....	34 50
501	".....	21 28
566	".....	35 22
647	".....	46 08
707	".....	33 74
823	".....	56 72
993	".....	40 01
1071	".....	38 06
1475	".....	62 05
	Total.....	\$487 36
117	Sherman House.....	\$31 75
161	".....	17 50
343	".....	105 60
499	".....	33 00
578	".....	14 50
752	".....	73 25
1167	".....	23 75
1304	".....	22 00
1527	".....	67 35
	Total.....	\$388 70
224	S. W. Johns.....	\$15 00
327	".....	30 70
574	".....	17 25
2731	".....	15 00
	Total.....	\$77 95
305	LaFayette Funk.....	\$5 00
562	".....	25 00
1552	".....	4 82
1795	".....	70 68

*Horticulture—Continued.*

Voucher.	To Whom Paid.	Amount.
1859	LaFayette Funk. ....	\$112 62
1905	" " .....	104 82
1962	" " .....	90 13
2036	" " .....	248 25
2114	" " .....	68 40
2181	" " .....	295 24
2287	" " .....	315 18
2473	" " .....	15 30
	Total .....	\$1353 44
265	B. Pullen. ....	\$10 00
370	" " .....	35 00
453	" " .....	15 00
571	" " .....	100 95
654	" " .....	42 73
706	" " .....	63 85
825	" " .....	10 00
908	" " .....	16 00
977	" " .....	5 00
1042	" " .....	30 50
1131	" " .....	11 50
1261	" " .....	36 80
1487	" " .....	104 30
	Total .....	\$481 63
144	W. D. Stryker. ....	\$15 00
259	" " .....	10 00
302	" " .....	15 00
563	" " .....	10 00
2730	" " .....	10 00
	Total .....	\$60 00
323	David Gore .....	\$19 50
570	" " .....	10 00
	Total .....	\$29 50
874	Jno. C. Ure. ....	\$330 06
1078	" " .....	146 00
1220	" " .....	83 38
1286	" " .....	100 00
1326	" " .....	106 50
1553	" " .....	305 38
1752	" " .....	435 53
1945	" " .....	200 00
2021	" " .....	13 80
2077	" " .....	500 00
2078	" " .....	51 15

*Horticulture—Continued.*

Voucher.	To Whom Paid.	Amount.
2113	Jno. C. Ure.....	159 70
2117	".....	250 00
2160	".....	392 00
2161	".....	500 00
2342	".....	765 00
	Total.....	<b>\$4,338 50</b>

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**Recapitulation.**

Miscellaneous.....	<b>\$1,342 54</b>
J. K. Dickirson.....	67 00
A. B. Hostetter.....	13 80
E. B. David.....	228 98
O. N. Dennis.....	487 36
Sherman House.....	388 70
S. W. Johns.....	77 95
L. Funk.....	<b>1,355 44</b>
B. Pullen.....	481 63
W. D. Stryker.....	60 00
David Gore.....	29 50
Jno. C. Ure.....	<b>4,338 50</b>
Total.....	<b>\$8,871 40</b>

## FISH EXHIBIT.

Voucher.	To Whom Paid.	Amount.
573	S. P. Bartlett.....	\$32 00
618	".....	26 50
943	".....	75 45
1374	".....	158 25
2086	".....	196 17
2349	".....	213 15
2478	".....	39 26
Total .....		\$740 78
371	Geo. Breuning.....	\$88 50
652	".....	93 33
999	".....	76 50
1352	".....	67 34
Total .....		\$325 67
1367	J. B. Mora .....	\$500 00
1655	".....	1,000 00
1823	".....	375 00
Total .....		\$1,875 00
MISCELLANEOUS.		
929	J. W. Taylor .....	\$47 50
1547	A. B. Hostetter.....	10 90
1712	Sandusky C. O. & D. S. Co.....	20 60
1752	Jno. C. Ure.....	145 95
1773	J. C. Vaughan.....	156 56
2196	Jno. Schulte .....	27 50
2325	Geo. W. Langford.....	83 10
Total .....		\$492 11

### Recapitulation.

S. P. Bartlett.....	\$740 78
Geo. Breuning.....	325 67
J. B. Mora.....	1,875 00
Miscellaneous .....	492 11
Total.....	\$3,433 56

## STATEMENT OF EXPENDITURES.

### ILLINOIS STATE BOARD OF WORLD'S FAIR COMMISSIONERS.

	DR.	CR.
Amount of original appropriation by General Assembly, July 1, 1891 .....	\$800,000 00	
Amounts reappropriated as follows:		
Illinois Woman's Exposition Board .....		\$80,000 00
State Dairymen's Association .....		15,000 00
State Horticultural Society .....		20,000 00
Brick and Tilemakers' Association .....		8,000 00
Illinois National Guard .....		10,909 90
Beekeepers' Association .....		3,500 00
Leaving net appropriation to I. B. W. F. C. ....		662,590 10
<b>Total.....</b>	<b>\$800,000 00</b>	<b>\$800,000 00</b>
<b>EXPENDITURES OF THE ILLINOIS BOARD OF WORLD'S FAIR COMMISSIONERS.</b>		
To amount of net appropriation .....	\$662,590 10	
To amount received from sale of building, furniture, etc. ....	3,926 50	
By expenditures account of general fund .....		*\$140,090 41
" construction and interior furnishing .....		277,872 58
By expenditures State Institutions .....		8,199 73
" grounds .....		4,817 65
" printing and stationery .....		†15,949 13
" natural history .....		21,618 11
" " .....		8,252 53
" education .....		20,461 81
" maps and drawings .....		6,604 30
" " relief map .....		15,596 50
" statistics .....		4,775 07
" live stock .....		39,996 03
" agriculture .....		13,006 44
" horticulture .....		8,871 40
" fish exhibit .....		3,433 56
To balance unexpended .....		76,971 55
<b>Total .....</b>	<b>\$666,516 60</b>	<b>\$666,516 60</b>
Total balance to account of \$800,000 appropriation from all sources, .....	\$89,480 25	

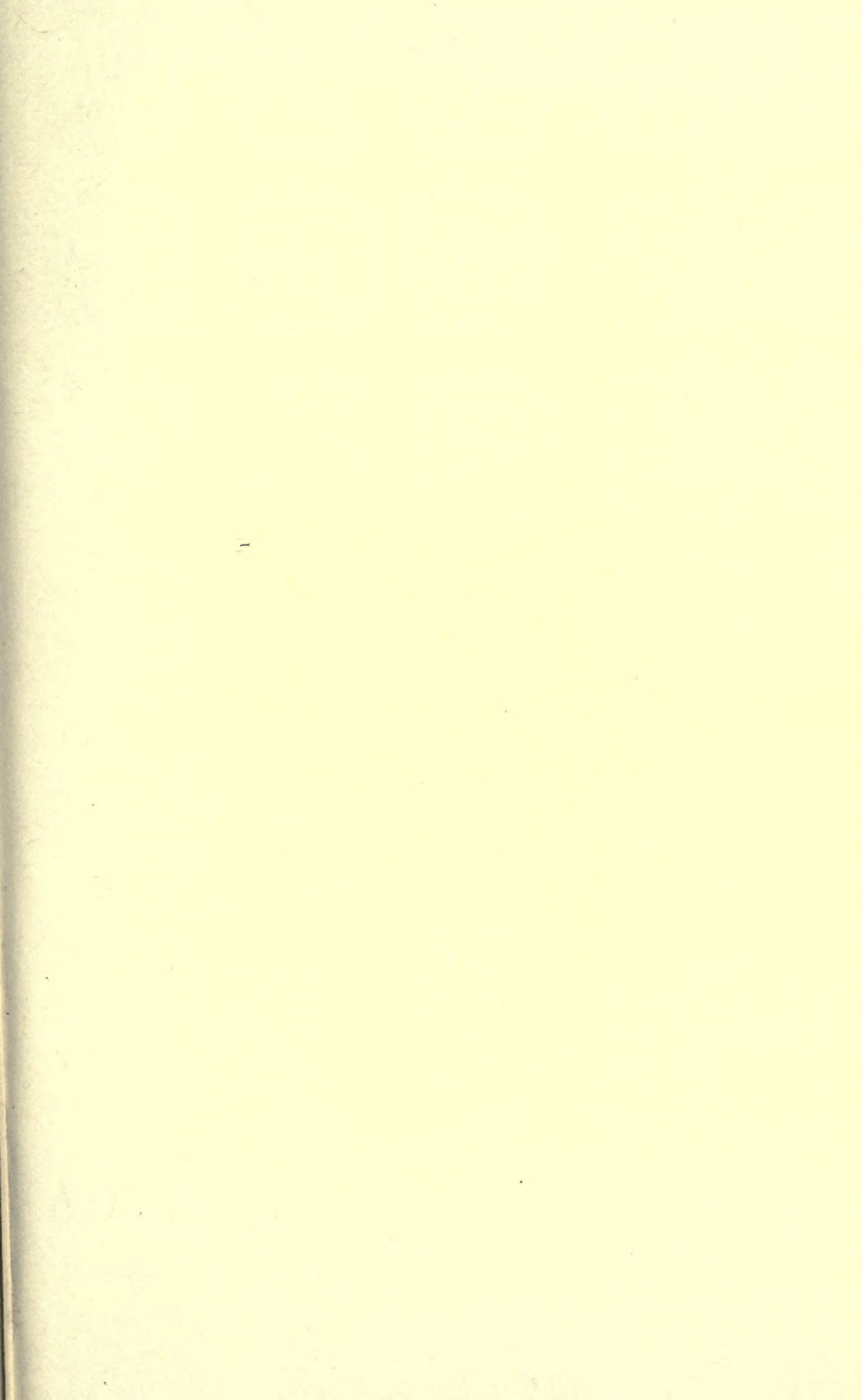
\*\$26.15. expenses Saml. Dysart, not included in itemized statement of General Fund.

†\$7,461.72 for publishing and distributing this report, not included in report of Printing and Stationery Committee, published elsewhere.





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